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**Preliminary Baseline
for the
Decontamination and Decommissioning
of the
Portsmouth Gaseous Diffusion Plant,
Piketon, Ohio**

Date Issued – December 2006

Prepared for the
U.S. Department of Energy
Portsmouth/Paducah Project Office

THETA PRO2SERVE MANAGEMENT COMPANY, LLC
managing the
Infrastructure Activities at the
Portsmouth Gaseous Diffusion Plant
under contract DE-AC24-05OH20193
for the
U.S. DEPARTMENT OF ENERGY

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CONTENTS

ACRONYMS	v
EXECUTIVE SUMMARY	vii
1. PRELIMINARY BASELINE FOR THE PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT	1
1.1 COST RANGES FOR FACILITY AND BUILDING D&D	2
1.2 RECOMMENDED ALTERNATIVE	3
1.2.1 Three-Year S&M.....	3
1.2.2 Phased D&D.....	4
1.2.3 CERCLA	5
1.2.4 No Size Reduction/On-Site Disposal Cell.....	5
1.3 PROJECT BUDGET/BASELINE CONSIDERATIONS	5
1.3.1 Financial Considerations	5
1.3.2 Scope Considerations	7
2. REFERENCES.....	9
APPENDIX A: WBS DICTIONARIES	A-1
APPENDIX B: PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT BASELINE BY YEAR	B-1
APPENDIX C: PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT SCHEDULE	C-1
APPENDIX D: PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT ESTIMATE SUMMARY WITH RANGES	D-1
EXHIBIT 1: PROJECT TIME AND COST ESTIMATE.....	E-1
EXHIBIT 2: ALTERNATIVE ANALYSIS	E-2
EXHIBIT 3: CONCEPTUAL DESIGN REPORTS	E-3
EXHIBIT 4: RISK MANAGEMENT PLAN	E-4
EXHIBIT 5: PRELIMINARY PROJECT EXECUTION PLAN	E-5

ACRONYMS

AA	Alternative Analysis
ARAR	Applicable or Relevant and Applicable Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CD	Critical Decision
CDR	Conceptual Design Report
D&D	decontamination and decommissioning
DOE	U.S. Department of Energy
EM	Environmental Management
FY	Fiscal Year
GDP	Gaseous Diffusion Plant
LOE	level-of-effort
NEPA	National Environmental Policy Act
PBS	Project Baseline Summary
RCRA	Resource Conservation and Recovery Act
S&M	surveillance and maintenance
U.S. EPA	U.S. Environmental Protection Agency
WBS	work breakdown structure

EXECUTIVE SUMMARY

The Portsmouth Gaseous Diffusion Plant decontamination and decommissioning (D&D) project scope is to D&D the process equipment, process buildings, and other facilities that are auxiliary to the gaseous diffusion process. The Portsmouth D&D Project assumes the site will enter a D&D program following the completion of the ongoing programs and subsequent to the Critical Decision (CD)-1 determination a competitive bid will be issued and awarded. The D&D project includes the demolition of 134 facilities at the Portsmouth near Piketon, Ohio. The 134 facilities comprise nearly 10,600,000 ft² of floor space.

Also, included as part of the project are other known requirements such as: oversight and technical support scope, construction, operation and closure of an On-site Waste Disposal Facility capable of handling the estimated waste volumes which range from approximately 1.4M m³ to 1.7M m³, Environmental remediation of contaminated soils and groundwater beneath the structures, and required surveillance and maintenance (S&M)/Infrastructure/Landlord functions. These components are considered essential for the successful completion of the project. The work breakdown structure (WBS) summary, descriptions and element total cost are demonstrated in Table ES. 1 Comprehensive project totals.

This document also contains a brief look at the planning process and exhibits of the major planning documents that were used as the basis for the preliminary baseline. These include *Alternative Analysis for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project*, TPMC/PORTS-66/R1 (TPMC 2006a), the *Conceptual Design Report for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project*, TPMC/PORTS-81/R1 (TPMC 2006b), and the *Final Cost and Schedule Summary Report, Scenarios I-VI & VIII* (PTC 2006) submitted on August 25, 2006.

The core of this baseline is built on the recommended approach as outlined below:

- 3 year S&M period from award of S&M/D&D Contract;
- Phased D&D;
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulatory strategy;
- No size reduction; and
- On-site disposal cell.

This approach is further defined throughout this document. Technical justification can also be found within the furnished exhibits.

Table ES.1 demonstrates each component of the project with a total project cost for each element.

Table ES.1. Comprehensive project totals.

WBS	Project description	Project totals
PORT.40.UD	Undetermined (Portsmouth D&D Project Budget)	\$5,249,381,871
PORT.40.UD.01	Owners Representation	\$291,475,436
PORT.40.UD.02	Building and Facility D&D	\$3,382,654,771
PORT.40.UD.03	Waste Disposal Cell	\$515,675,508
PORT.40.UD.04	Environmental Remediation/Deferred Units	\$256,517,515
PORT.40.UD.05	S&M/Landlord/Infrastructure	\$803,058,641

1. PRELIMINARY BASELINE FOR THE PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT

The purpose of this document is to outline the schedule and cost range for the decontamination and decommissioning (D&D) project of the Portsmouth Gaseous Diffusion Plant. The baseline is based on and consistent with the *Alternative Analysis for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project*, TPMC/PORTS-66 (TPMC 2006a), that has been performed for the Portsmouth D&D project Critical Decision (CD)-1 requirements. The planning team performed an analysis on seven different technical scenarios:

- Scenario 1 – Prompt, no size reduction, on-site disposal, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulated;
- Scenario 2 – Phased, no size reduction, on-site disposal, CERCLA regulated;
- Scenario 3 – Prompt, no size reduction, off-site disposal, CERCLA regulated;
- Scenario 4 – Prompt, size reduction, on-site disposal, CERCLA regulated;
- Scenario 5 – Prompt, size reduction, off-site disposal, CERCLA regulated;
- Scenario 6 – Prompt, no size reduction, on-site disposal, Resource Conservation and Recovery Act (RCRA) regulated; and
- Scenario 7 – Long-term surveillance and maintenance (S&M).

During the analysis, it was determined that the seventh scenario (S&M only) did not accomplish the project requirements and was deemed non-applicable.

In formulating the selected alternative, various components, drivers, and requirements were evaluated and then documented in the Alternative Analysis (AA). The result is an alternative that considers U.S. Department of Energy (DOE) near-term needs, policy determinations, ongoing DOE missions, and budget constraints, which was subsequently chosen as the recommended alternative. The recommendation is a hybrid scenario defined as Scenario 8 that takes into consideration the technical parameters as described in the AA, and incorporates into the analyses the previously mentioned drivers and requirements with equal deliberation. The estimate development and AA identified cost and schedule ranges for each scenario including scenario eight. The preliminary baseline utilizes the alternative eight point estimate as the basis for the expansion of annual budget outlays that demonstrate a conceptual lifecycle for the project.

Following thoughtful measurement and due consideration of the relevant factors, the analyses rendered the following recommendations:

- 3 year S&M period from award of S&M/D&D Contract;
- Phased D&D;
- CERCLA regulatory strategy;
- No size reduction; and
- On-site disposal cell.

To support the CD process and broaden the development of the recommended alternative, a Conceptual Design Report (CDR) titled, *Conceptual Design Report for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project* (TPMC 2006b), has been assembled which describes project requirements and objectives. The CDR also outlines the technical approach for accomplishing the recommended alternative. This is in accordance with DOE Order 413.3, *Program and Project Management for the Acquisition of Capital Assets* (DOE 2000). The CDR, the AA, and the *Final Cost and Schedule Summary Report, Scenarios I-VI & VII* (PTC 2006), submitted on August 25, 2006, were utilized as the basis for evaluation of a methodology and approach to accomplish the project.

1.1 COST RANGES FOR FACILITY AND BUILDING D&D

The single largest component of Portsmouth D&D project is the building and facility demolition. As a result the estimates for these elements were independently developed to support the AA. During the AA for the building and facility D&D, a work breakdown structure (WBS) was developed for estimating purposes as a tool to accomplish multiple scenario capabilities. The estimating tool was utilized to meet the desire of, and have the ability to demonstrate various “views” of the project. This allowed evaluation of various project technical approaches and strategies and generated preliminary cost ranges for the D&D of buildings and facilities. The *Final Cost and Schedule Summary Report, Scenarios I-VI & VIII* summarizes the cost ranges of those scenarios for the gaseous diffusion plant (GDP) building and facility D&D. While planning for this scope is still in the early stages, the following section from the report details these findings:

“The conceptual D&D estimates provide supporting data for AA and evaluation components for CD-1 – Approve Preliminary Baseline Range CD-1. The estimates provide a consistent cost estimation basis for decision making purposes only. The estimates are preliminary baseline range estimates. Project performance baseline development will commence when the project obtains the CD-1 approval and enters the Approved Performance Baseline CD-2 phase of planning.

The development of the conceptual estimates employed modeling, bottoms up, and level-of-effort (LOE) estimating techniques to determine the costs involved in the demolition of the process facilities buildings, the radiation contaminated ancillary buildings, and non-contaminated ancillary facilities (including utilities and infrastructure items). These estimates have scenario variables encompassing off- vs. on-site waste disposal, debris size reduction vs. intact debris disposal, immediate vs. partially delayed demolition, and CERCLA vs. RCRA regulation of landfill construction, operation and caretaking. Estimate results are summarized in Table 1.

Table 1. Summary of building and facility final estimate results and ranges

Scenario	Low range (-30%)	Estimate	High range (+50%)
I	\$1.9B	\$2.7B	\$4.1B
II	\$2.0B	\$2.8B	\$4.3B
III	\$3.9B	\$5.6B	\$8.3B
IV	\$2.1B	\$3.0B	\$4.5B

Table 1. Summary of building and facility final estimate results and ranges (continued)

Scenario	Low range (-30%)	Estimate	High range (+50%)
V	\$4.0B	\$5.7B	\$8.5B
VI	\$2.1B	\$3.0B	\$4.5B
VIII	\$2.7B	\$3.9B	\$5.9B

The conceptual cost estimates show that the two off-site scenarios (III and V) are the most expensive (\$5.6B and \$5.7B) and the five on-site scenarios are lower in cost (\$2.7B to \$3.9B) in terms of constant dollars. Six of these scenarios do not have any resource limitations and attempt to develop least cost and optimized results, only Scenario VIII is funding constrained. The D&D sequence assumes that the X-333 will be started first, followed in series by the X-330 and X-326 buildings. The other facilities subject to D&D are planned and sequenced by their complexity, from the more complex to the least complex in terms of D&D effort

Waste volumes range from approximately 1.4M m³ to 1.7M m³ and weights from 3.5M to 3.6M tons. Size reduction efforts did not result in significant declines in waste volume quantities. The cost of off-site transportation and disposal of wastes is significant and is the primary discriminator in the selection of scenarios.

Additionally, numerous risks have been documented for future planning initiatives to support the Portsmouth D&D project. The materialization of regulatory and transportation risks, with their respective entities, pose the greatest potential impact to the D&D project. Quick and inclusive resolution of these project risks by management will allow the project to minimize interruptions and to help ensure project success.”

As Scenario 8 was defined and consideration sufficiently outlined, a cost range was developed. Table 2 demonstrates the draft Portsmouth building and facility D&D Scenario 8 cost range.

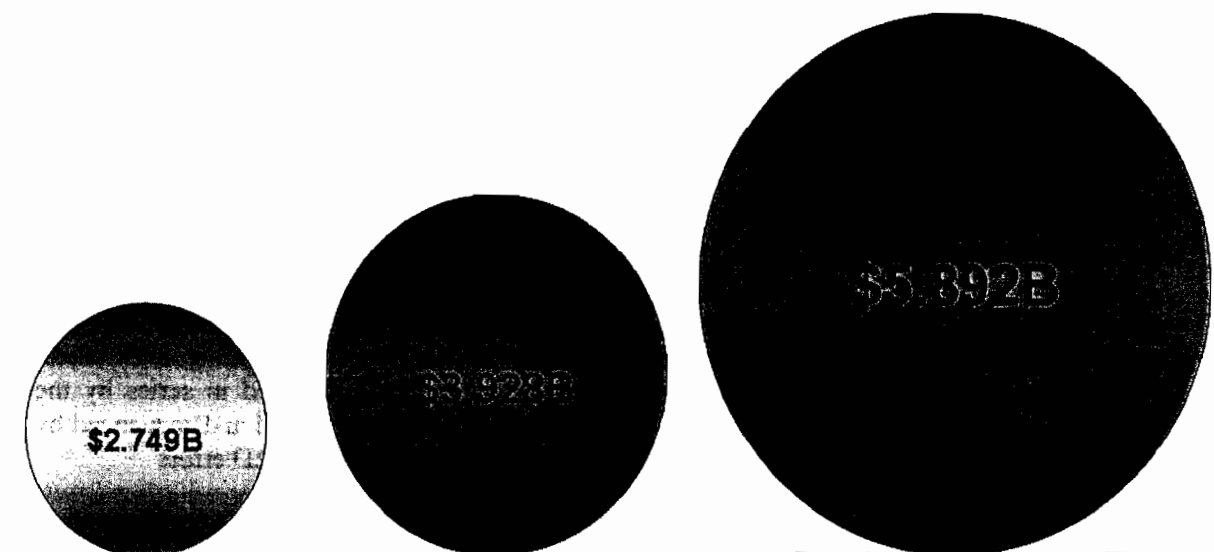
1.2 RECOMMENDED ALTERNATIVE

The recommended alternative consists of five key components which determine the basis for all conceptual planning and preliminary baseline development. They are described in the following sections.

1.2.1 Three-Year S&M

The S&M period is consistent with the philosophy outlined in the, *Department of Energy Five Year Plan, Volume II* (DOE 2006), issued March 2006. This approach allows DOE to complete the current mission at the Portsmouth and the planned completion of DOE missions in Oak Ridge. Thus, allowing for the preparation of DOE’s next phase of D&D to be initiated at Portsmouth, following the S&M period.

Table 2. Scenario VIII – Two-phase building and facility D&D without size reduction



Low Range Estimate	Estimate	High Range Estimate
\$2.749	\$3.928	\$5.892

As a result of extensive evaluations performed on the existing systems and utilities at the Portsmouth, a series of utilities reconfigurations and optimizations have been identified as requirements during the S&M period. The existing systems currently require considerable manpower and materials to maintain safe and compliant operating conditions. The identified utilities reconfigurations and optimizations are to be performed as part of the S&M phase as transition requirements to allow for efficient D&D activities. Without the proper arrangement of utilities and systems S&M activities will impede the schedule of for D&D performance through unnecessary utilization of funds and manpower.

A preliminary S&M scope dictionary, based upon the planned completion of utilities' optimizations, has been developed to demonstrate the specifics associated with the S&M, Infrastructure, and Landlord requirements during the D&D program. (See Appendix A, WBS PORT.40.UD.05)

1.2.2 Phased D&D

The phased D&D, as outlined in the selected alternative, facilitates continued support of the ongoing American Centrifuge Plant initiative, and as a result, facilities and systems used in support of the American Centrifuge Program are being delayed for a 30-year commercial operation period. This alternative assumes that at that time these facilities will be de-leased and returned to DOE for final D&D.

The Portsmouth D&D activity is planned to commence at the completion of the DOE Environmental Management (EM) Five-Year Plan. D&D activities will be initiated in accordance with the CD Process under CD-3, Notice to Proceed. A preliminary scope dictionary for the gaseous diffusion process buildings and the balance of plant facilities is provided in Appendix A of this document. It describes the logical sequence of activities planned to accomplish the Portsmouth building and facility D&D. (See Appendix A, WBS PORT.40.UD.02)

1.2.3 CERCLA

The selected alternative assumes performance will be conducted as a non-time-critical removal action under CERCLA. All aspects of the project will be governed by applicable or relevant and appropriate requirements (ARARs) documented in the approved Action Memorandum prepared for the non-time-critical removal actions. This is consistent with the agreement between the U.S. Environmental Protection Agency (U.S. EPA) and DOE which established a tailored approach for decommissioning DOE's contaminated facilities as non-time-critical removal actions. This process is outlined in: *The Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act* (DOE 1995), signed on May 22, 1995 by the Assistant Administrator of the U.S. EPA and by DOE's Assistant Secretary for EM.

This approach is also consistent with DOE Order 430.1B, Real Property Asset Management, which states that the process for the disposition of physical assets, particularly contaminated facility disposition, shall utilize a non-time-critical removal action as the approach for decommissioning, using the tailored process negotiated with the U.S. EPA. One of the steps in this process is the evaluation of alternatives. The Secretarial Policy on the National Environmental Policy Act (NEPA), DOE, June 1994, provides for incorporating NEPA values into CERCLA documents, such as analysis of cumulative, off-site, ecological and socioeconomic impacts, to the extent practicable. If decommissioning is not performed as a CERCLA response action, but rather as a non-time-critical removal action, an evaluation comparable to that which would be performed under a separate NEPA review will be incorporated as the project progresses.

1.2.4 No Size Reduction/On-Site Disposal Cell

The recommended project alternative has developed both cost and technical justification to limit size reduction and the utilization of on-site disposal as the waste disposition path. The AA cost ranges support the selection for on-site disposal and technical justification is presented in the CDR for this approach.

1.3 PROJECT BUDGET/BASELINE CONSIDERATIONS

In addition to the documents and criteria previously identified as prerequisites for baseline development, further criterion has been determined appropriate for analysis of the project. These considerations are both financial and scope oriented. The following statements will give a brief reflection of those considerations.

1.3.1 Financial Considerations

Portsmouth has multiple Project Baseline Summary (PBS) elements that must be understood when analyzing the site budget requirements. All major components of the Portsmouth D&D project will be executed under PBS PO-0040: Nuclear Facility D&D and are planned for initiation following a three year S&M window which is to begin in 2009. The acquisition strategy may put a contract in place prior to the defined schedule to initiate field work for facility removal. The selected alternative demonstrates field implementation for the Portsmouth D&D for 2012 (See Appendix C of this report, Portsmouth D&D Project Schedule).

Additional budget considerations have been incorporated into the selected alternative. The budget outlay for a three year S&M phase is planned to be integrated into the *Department of Energy Five Year Plan, Volume II*. The DOE Five Year Plan covers the fiscal year (FY) range 2007-2011 and demonstrates a declining site budget, based on completion of approved and ongoing activities.

Engineering evaluations have recognized the condition of the current site infrastructure associated with utilities and support systems that were not adequately addressed in the Office of Environmental Management five year plan and should be adjusted for incorporation of budget requirements to support reconfiguration of those systems and utilities. Based on the budget request cycle, planning for these changes is currently ongoing, and should be considered for incorporation into the 2009 budget module. This schedule is consistent with the ongoing work at the site and will allow for the necessary system configurations and optimizations to be completed during the S&M phase of the project. In this scenario, recognized efficiencies are realized and in place prior to the initiation of field implementation for building and facility D&D.

Table 3 demonstrates the current Portsmouth PBS budget target allocation as outlined in the DOE Five Year Plan FY 2007 – FY 2011. Safeguards and Security is also included as necessary for a comprehensive understanding.

Table 3. DOE Five-Year Plan FY 2007 – FY 2011 (Portsmouth)

PBS Designation	PBS Description	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
PO-0011	NM Stabilization and Disposition-Portsmouth Uranium Facilities Management	\$19,515	\$7,754	\$5,201	\$5,207	\$5,273
PO-0011X	NM Stabilization and Disposition-Depleted Uranium Hexafluoride Conversion	\$32,700	\$40,750	\$37,850	\$35,000	\$35,000
PO-0020	Safeguards and Security	\$15,642	\$15,667	\$15,649	\$15,906	\$15,979
PO-0013	Solid Waste Stabilization and Disposition	\$19,410	\$15,236	\$0	\$0	\$0
PO-0040	Nuclear Facility D&D-Portsmouth	\$131,202	\$76,865	\$72,507	\$69,855	\$69,247
PO-0041	Nuclear Facility D&D-Portsmouth GCEP	\$20,000	\$0	\$0	\$0	\$0
PO-0101	Portsmouth Cold Standby	\$0	\$0	\$0	\$0	\$0
PO-0103	Portsmouth Contract/Post-Closure Liabilities/Administration (D&D Fund)	\$410	\$420	\$431	\$442	\$453
PO-0104	Portsmouth Community and Regulatory Support (D&D Fund)	\$298	\$306	\$313	\$321	\$329
Portsmouth Site Total		\$239,177	\$156,998	\$131,951	\$126,731	\$126,281

The Portsmouth D&D project is currently evaluating the budget outlays and is developing the engineering plans and studies in support the additional requirements during S&M in preparation for D&D. In FY 2012, the budget scenario identified for the Portsmouth D&D project will be increased to support field implementation of the comprehensive Portsmouth D&D Projects. Scenario VIII assumes level funding in unescalated FY 2012 dollars for the project and under this case the project funding available for the D&D project will be approximately \$180M to \$200M annually. This will create a constant environment for the project and enhance stabilization to the local socio-economic concerns following the eminent workforce reductions recognizable in the Five-Year Plan budget outlays.

The advantage of level and known funding for the site is that it creates a more plausible planning environment for future manpower requirements needed for execution of work. The level funding consideration will have the affect of increasing the overall duration of the project and at this phase of planning demonstrates an increase in the cost of static LOE activities over time. However, it is believed that as the project progresses these LOE activities can be optimized and reductions can be demonstrated as D&D moves forward. The reductions in S&M and LOE activities over time will reduce overall costs that may then be applied to the D&D effort. This should serve to offset any increase resulting from constrained budget schedule impacts.

1.3.2 Scope Considerations

The identified annual allotment of between \$180M to \$200M will need to support all elements of the project. In addition to the building and facility D&D estimates that were defined and evaluated as part of the AA, other known requirements such as: oversight and technical support scope, construction, operation and closure of an On-Site Waste Disposal Facility, Environmental Remediation of contaminated soils and groundwater beneath the structures, and the required S&M/Infrastructure/Landlord functions must be explicit to depict a comprehensive view of the project. Each of these elements are logically interrelated and considered essential for success of the total project. These are consistent with and supportive of the intended purpose of the D&D fund. Once defined the major components were integrated into the scenarios and cost ranges applied across all elements. The Portsmouth D&D Project Estimate Summary table demonstrates the comprehensive scenarios with cost ranges (see Appendix D of this report, Portsmouth D&D Project Estimates Summary).

As previously mentioned, the estimating tool utilized a WBS designed to meet the desire of, and have the ability to demonstrate various “views” of the project. This type of structure, while allowing for and meeting the needs of an AA, is not specifically tailored to the execution of work with specific breakdowns for planned elements of the project. For the purpose of baseline development, even at the preliminary stages a more execution/project-oriented structure is utilized to integrate the major activities or components of the project. The following defines the project work breakdown and demonstrates the major execution elements for the Portsmouth D&D Project. The structure is outlined as follows and is incorporated into the site integrated WBS:

- PORT.40.UD.01 – Owners Representation
- PORT.40.UD.02 – Building and Facility D&D
- PORT.40.UD.03 – Waste Disposal Cell (On-Site Waste Disposal)
- PORT.40.UD.04 – Environmental Remediation (Deferred Units)
- PORT.40.UD.05 – S&M/Infrastructure/Landlord

Figure 1 demonstrates the Portsmouth site-wide lifecycle WBS with the identified PBS and placement of the Portsmouth D&D project within its overall structure.

The compilation of these components represents the Portsmouth D&D project which is currently planned for performance under DOE PBS PO-0040, Nuclear Facility D&D.

The P Project Baseline by Year Report (see Appendix B of this report) is inclusive of the identified D&D project elements and demonstrates a comprehensive annual budget outlay for each component. The annual budget outlay incorporates the interrelationships and requirements necessary for each component within the constrained funding case to accomplish the project.

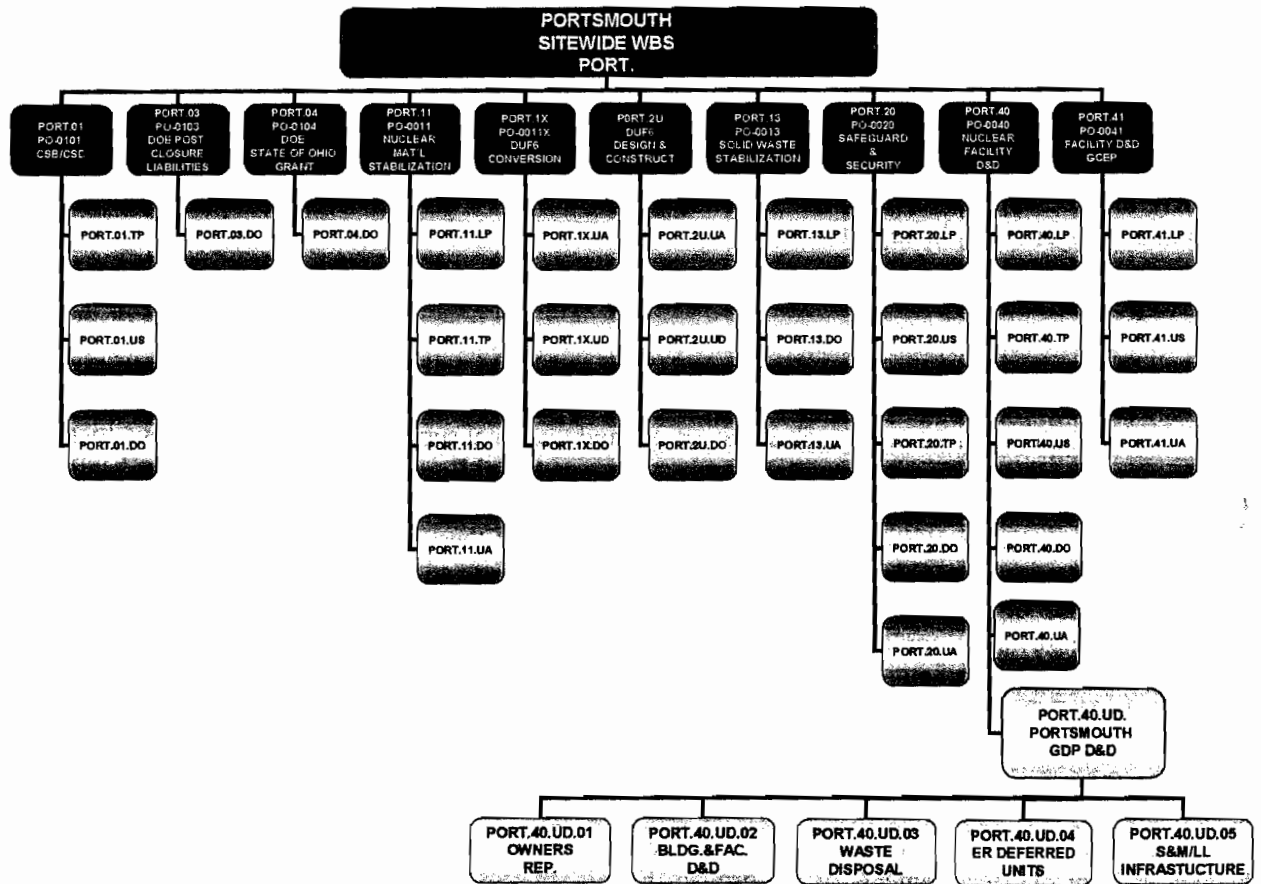


Fig. 1. Portsmouth site-wide lifecycle WBS.

2. REFERENCES

- DOE (U.S. Department of Energy) 1995. *The Policy on Decommissioning of Department of Energy Facilities Under the Comprehensive Environmental Response, Compensation, and Liabilities Act*, May 1995.
- DOE 2000. *Program and Project Management for the Acquisition of Capital Assets*, DOE O 413.3, U.S. Department of Energy, Oak Ridge, TN.
- DOE 2006. *Department of Energy Environmental Management Five Year Plan, FY 2007 – FY 2011, Volume II*, U.S. Department of Energy, Lexington, KY, March 2006.
- PTC (Project Time and Cost, Inc.) 2006. *Final Cost and Schedule Summary Report, Scenarios I-VI & VIII*, Project Time and Cost, Inc., August 2006.
- TPMC (Theta Pro2Serve Management Company LLC) 2006a. *Alternative Analysis for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project*, TPMC/PORTS-66/R1, September 2006.
- TPMC 2006b. *Conceptual Design Report for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project*, TPMC/PORTS-81/R1, September 2006.

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APPENDIX A

WBS DICTIONARIES

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.01		5. WBS ELEMENT TITLE Owners Representation	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION CD-1 Approve Alternative Selection and Cost Range		8. DATE TBD
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION Conceptual Design PORTS Owners Representation		11. PBS ELEMENT NUMBER(s) PBS PO-0040	
<p>INTRODUCTION</p> <p>As a result of the recognized needs based on Lessons Learned from other DOE sites where large complex projects are being performed the Owners Representation element of the Portsmouth Decommissioning & Decontamination (D&D) Project has been established. The main purpose of Owners Representation for the D&D Project is oversight of the facilities demolition at the site. It is involved in all phases of the D&D project and broken into five sections: Transition, Plan and Prep, Field work D&D, Post D&D (Balance of Plant) and Closeout.</p> <p>Owners Representation will support the DOE needs for both technical and management oversight support as associated with the five sections previously identified. The support will encompass areas such as Environmental Safety and Health (ES&H), Regulatory Compliance, Engineering Operational Readiness, Safety Basis, Nuclear Criticality and Quality Assurance.</p> <p>LOGIC RELATIONSHIPS</p> <p>The Owners Representation is considered a parallel activity associated with all field execution elements at the site.</p> <p>SCOPE DESCRIPTION</p> <p><u>Transition:</u></p> <p>During the transition period many activities must be performed just before or soon after a nuclear facility concludes its mission and enters the transition phase from operation to decommissioning. These activities include assurance of immediate and long-term safety for the facility systems, human resources challenges, systems configuration changes, regulatory changes, and stakeholder relations. Long-term stewardship and eventual site closure activities must also be considered and addressed.</p> <p>Activities include but are not limited to the following:</p> <ul style="list-style-type: none"> -Placing the facility and systems into a safe shutdown condition -Organizational realignment -Near-term licensing and regulatory interaction with cognizant regulators -Procedure, process, and program reduction -Contractual realignment -Site Characterization -Facility Modification to support decommissioning -Personnel and contractor training -Preparation for decommissioning activities <p><u>Planning and Preparation:</u></p> <p>During the Planning and Prep Period, in order to conduct the decommissioning project, a request must be made through submittal of a Decommissioning Plan (DP). The effort required to prepare the DP is only slightly proportional to the amount of decommissioning work required, and is more dependent upon the degree of radiological and/or industrial safety issues. Preparation of the DP for the Portsmouth Gaseous Diffusion Plant facility will include performance of the following subtasks, for inclusion into the DP:</p>			

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.01	5. WBS ELEMENT TITLE Owners Representation	

-Prepare and provide a conceptual decommissioning work plan, with safety analysis and limits provided

-Prepare and provide a Project Management and Control Plan

-Prepare and provide a summary of the project Health and Safety Plan, with key operating limits

-Propose Final Survey Plan

-Prepare and provide a Waste Management Plan

-Prepare and provide ALARA analysis to justify the decommissioning approach taken, based on minimization of worker dose, and the margin below the termination criteria that the license can reasonably attain

-Prepare and provide an accident analysis, indicating that provisions will be in place to mitigate the consequences of foreseeable accidents

-Prepare a Decommissioning Funding Plan

-Perform Detailed Planning and Engineering

Detailed planning typically starts after the DP has been submitted to the regulator and while the license is waiting for approval. Detailed planning also continues on into the implementation phase. This task's deliverables provide the project with the following for execution of field work:

General work procedures, whereby two kinds of instructions specific to the decommissioning are provided. First, to control how routine support work is conducted, including procedures for health physics, waste management, emergency preparedness, worker and material access and egress control, etc. Secondly, there would be generic instructions on how to perform the D&D work, such as how to cut activated steel, break up contaminated concrete, or contain airborne dust using tents and portable HEPA filter units.

Field work D&D, Post D&D (Balance of Plant) and Closeout:

Detailed Work Packages (DWPs) are prepared to provide detailed step-by-step instructions to workers on how to implement a task (e.g., remove the activated concrete). Each work package would contain a hazard and radiological risk assessment that may trigger the need for an engineering safety analysis, such as to assess the thickness of material that can be removed from the ceiling or wall before structural collapse becomes an issue. Additionally, required permits and their special instructions to support personnel are provided. The DWP packages would also specify non-routine requirements, such as equipment, tools, subcontractors, hold or inspection points, etc.

The Field work D&D period is when the physical Deactivation and Decommission of the Process facilities occurs.

The Post D&D (Balance of Plant) period is the period when the physical Deactivation and Decommission of the Non Process Facilities will be performed; it is to take place after the Deactivation and Decommission of the Process Facilities.

The Closeout period is the period when all of the Post Field work activities occur.

Each of the five sections is broken down further in to two sections, Project management and integrated support.

Project Management will verify that the contractor follows the scope and regulatory requirements for the project. The Project Management for the Owners Representation will not supervise the contractor in the field. The Project Management for the Owners Rep is broken in to four sections: Plant Management, Regulatory/DOE Liaison, Contracts and Legal Affairs.

Plant Management is the top management group of the Owner's Representative. The group consists of the Project Director, Deputy Plant Manager, Executive Administrative Assistant, Human Resources Specialist, and the Staff Health Physicist. The specific responsibilities of this group include, but are not limited to:

- Management of the Project
- Review of work plan
- Review of Health and Safety Plan
- Designation of the field oversight team
- Briefing field oversight teams on their specific assignments
- Manage project communication activities
- Provide miscellaneous project administrative support
- Manage project document control
- Provide project Human Relations (HR)/Labor Relations
- Provide guidance and counseling to project management in employee relations issues

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.01	5. WBS ELEMENT TITLE Owners Representation	
<ul style="list-style-type: none">-Administer and provide guidance to project employees with regard to HR policies-Provide general HR expertise to the project in such areas as performance appraisal training assistance with position descriptions, counseling employees, etc.-Administer the Compensation Program within the project (i.e. merit planning, promotion planning, and ensuring compliance with Company policies and guidelines)-Assist and act as a resource in the discipline process for both salaried and hourly employees-Provide guidance in issues with hourly employees-Represent Labor Relations and assist the first-line supervisor in step 1 of the grievance procedure-Assist management in interpreting the labor agreements, with appropriate guidance from Labor Relations		
<p>The Regulatory/DOE Liaison group serves as the liaison between the D&D contractor and DOE/the State/Regulatory agencies. This group consists of a Regulatory Affairs Engineer and Specialist. The specific responsibilities of the Regulatory/DOE Liaison group include, but are not limited to:</p> <ul style="list-style-type: none">-Maintain open lines of communication between the D&D Contractor and DOE-Maintain open lines of communication between the D&D Contractor and the State-Maintain open lines of communication between the D&D Contractor and Regulatory Agencies-Review all data and information for compliance with the DOE, State, and Regulatory agencies.		
<p>The Contracts group consists of a Contracts Manager and Specialist. The specific responsibilities of the Contracts group include, but are not limited to:</p> <ul style="list-style-type: none">-Review D&D Contractor subcontracts		
<p>The Legal Affairs Department provides counsel to all levels of management and project teams on legal and regulatory issues, including environmental, safety, and health; employment; labor; procurement; engineering; tax; contracts; and disputes. Legal advises Owner's Representative management of potential legal risks and liabilities to Owner's Representative or DOE and identifies options to minimize these risks. Legal develops strategies for Owner's Rep. to achieve and maintain compliance with all applicable Federal, state, and local laws; the Tri-Party Agreement; DOE directives and orders; contractual provisions; and other applicable requirements.</p>		
<p>The integrated Support of the Owners Rep is the support provided to the Project Management effort. The Integrated support is broken down into four sections: Clerical, Public Relations, IT and Decommissioning Planning and Engineering Review team.</p>		
<p>The Clerical group is the administrative assistant pool for the Owner's Representative. The specific responsibilities of the Clerical group include, but are not limited to:</p> <ul style="list-style-type: none">-Manage project communication activities-Provide miscellaneous project administrative support-Manage project document control		
<p>The Public Relations will maintain public viewing room for activities at the site. This group consists of a Records Clerk and Public Relations Specialist. The specific responsibilities of the Public Relations group include, but are not limited to:</p> <ul style="list-style-type: none">-Manage project document control for public reading room-Responsible for dissemination of information to the public		
<p>The IT group manages all the computer, software, and network issues for the Owner's Representative. This group consists of several IT Technicians. The specific responsibilities of the IT group include, but are not limited to:</p> <ul style="list-style-type: none">-Manage project computers and software-Responsible for network, internet security software update, firewall, and backup of network files		
<p>The Decommissioning Planning and Engineering Review Team serves as review team for all work performed by the D&D contractor. This group consists of Project Engineers, Radiological Engineers, Civil/Structural Engineers, HSE Specialist, Engineering Managers, Plant HSE&A Manager, Schedulers/Planners, and Cost Controllers. The specific responsibilities of the Decommissioning Planning and Engineering Review Team group include, but are not limited to:</p> <ul style="list-style-type: none">-Review of Work Packages and Schedules-Review of Environmental, Health, and Safety Data and Information-Review of Project Costs-Review of Criticality Data and Information		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.01	5. WBS ELEMENT TITLE Owners Representation	
<p>-Review of Waste Management Data and Information</p> <p>-Review of Quality Assurance Data and Information</p> <p>-Review of Surveillance and Maintenance Data and Information</p>		
SAFETY SYSTEMS <p>An Integrated Safety Management System (ISMS), based on DOE's ISMS will be implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to all project tasks and activities.</p> <p>The five core functions are: (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The seven guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, and (7) operations authorization.</p>		
SCOPE ASSUMPTIONS		
General <ul style="list-style-type: none">• The D&D project will be conducted in compliance with DOE Orders including DOE Order 413.3 and 430.1B.• Any required utility reconfiguration is not included in this WBS element but is assumed to be performed as part of S&M.• Work will be executed by a competitively selected fixed-price contractor.• An independent construction quality assurance contractor will perform oversight of construction activities and will perform verification testing.• Adequate cleared personnel are available to meet project schedule.• No recycling of materials (i.e. steel, concrete, nickel, etc.).• No waste will be transuranic waste (exceed 100nCi/g).		
Environmental, Health, and Safety <ul style="list-style-type: none">• ISMS will be used on all phases of the project to ensure that work is performed safely.• Safety Basis documents including a Documented Safety Analysis (DSA) will be prepared and implemented.• A Nuclear Criticality Safety Analysis (NCSA) will be performed.• An Operational Readiness Review (ORR) will be performed prior to physical D&D work.• The PORTS project will be conducted as a CERCLA non-time-critical Removal Action per the EPA/DOE joint D&D Policy of 1995.• Certain environmental permits and an environmental impact statement will not be required.• PPE required for cell floor walk-downs is coveralls and gloves.		
Hazardous Material Abatement <ul style="list-style-type: none">• Excess equipment and materials will be removed from the process building and disposed of in the OSWDF.• Liquids will be drained and disposed of at an approved off-site facility.• PCB contaminated building ventilation system ductwork and gaskets will be removed (bulk PCB waste).• Sealed electric capacitors containing 100% PCB oil will be removed from the buildings as PCB wastes.• Wastes will be characterized for disposal to meet disposal facility WAC.• Solid wastes will be packaged and transported to the OSWDF or an appropriate off-site facility.• Mixed wastes and liquids not meeting the OSWDF WAC will be disposed of at a licensed off-site facility.		

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4. WBS ELEMENT CODE PORTS.40.UD.01	5. WBS ELEMENT TITLE Owners Representation	
Process Equipment Removal		
<ul style="list-style-type: none">Some equipment in X-326 will contain greater than always safe mass and will require special provisions to address criticality issues.The major equipment has been purged so that there is no significant volume of gaseous uranium compounds in the equipment.No size reduction by crushing, compacting, shredding, shearing, segmenting, and otherwise dismantling will be accomplished unless economic, regulatory, and operational advantages exist.		
Building Demolition		
<ul style="list-style-type: none">Following process equipment removal, the three large process buildings will no longer be categorized as nuclear facilities.Decontamination of structures will be limited to that necessary to protect workers and meet the OSWDF WAC.Classified components will be removed before building demolition.Un-cleared workers may perform demolition work.The buildings will be completely demolished including the slabs, foundations, piers, and substructures down to four ft below grade.Basements and tunnels will have their roofs removed and be backfilled.One Removal Action Report will be prepared for the entire project.		
RISK MANAGEMENT		
<p>The <i>Risk Management Plan for Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant</i> has been prepared and provides the program and methodology that will be used to assess all project risks including those related to building D&D. Those risks will be identified, assessed, handled, and monitored in accordance with this plan.</p>		
Identified Risk/Potential Hazards		
<ul style="list-style-type: none">Radiological hazardsChemical hazardsFire hazardsCompressed gas cylinder hazardsIndoor air quality hazards		
BASIS OF ESTIMATE		
<p>This Life Cycle Baseline estimate was prepared for preliminary planning purposes and is considered conceptual in nature. This estimate should be considered between a Class 3 Preliminary and Class 5 Order of Magnitude cost estimate. The estimate was prepared from an approved cost estimating model, which was developed at summary levels based on either actual historical experience for similar work or best engineering judgment. The excavation portion of the estimate required the input of the facility's gross square footage, relationship to deferred unit and historical data to derive estimate values for required soils removal. Unit prices were then applied to associated activities based on facility size, usage, and expected contamination levels.</p>		
<p>The basic premise for CD-1 estimates are defined per the "DOE Cost Estimating Guide for Program and Project Management, DOE G 430.1-IX, April 2004." As per the DOE cost estimating guidance the project is at "Critical Decision (CD)-1, Approve Alternative Selection and Cost Range." Cost estimates prepared to support CD-1 will range from Class 5 Order of Magnitude to Class 3 Preliminary cost estimates using several cost estimating techniques.</p>		
<p>The five DOE cost estimate classifications are based on AACE's Recommended Practice for Classifying Cost Estimates (AACE International Recommended Practice No. 17R-97; Appendix J). The following table lists all the cost estimating classifications.</p>		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.01		5. WBS ELEMENT TITLE Owners Representation	

Cost Estimate Classifications

Cost Estimate Classification	Primary Characteristics	
	Level of Definition (% of Complete Definition)	Cost Estimating Description (Techniques)
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (Parametric, specific analogy, expert opinion, trend analysis)
Class 4, Intermediate	1% to 15%	Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)
Class 3, Preliminary	10% to 40%	Various, including combinations (detailed, unit-cost, or activity-based; parametric; specific analogy; expert opinion; trend analysis)
Class 2, Intermediate	30% to 70%	Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)

SCHEDULE ASSUMPTIONS

- OSWDF capacity is available when needed.
- Characterization and remediation at the "deferred units" will be coordinated with demolition activities.

REQUIREMENTS/DRIVERS

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Toxic Substance Control Act (TSCA)
- Atomic Energy Act of 1954 as amended
- National Environmental Policy Act (NEPA)
- Federal Facilities Compliance Act (FFCA)
- National Historic Preservation Act (NHPA)

PROJECT SCHEDULE

See attached.

BASELINE BY YEAR

See attached Baseline by Year Report.

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.02		5. WBS ELEMENT TITLE Building and Facility D&D	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION CD-1 Approve Alternative Selection and Cost Range		8. DATE TBD
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION Conceptual Design PORTS Building and Facility D&D		11. PBS ELEMENT NUMBER(s) PBS PO-0040	
<p>INTRODUCTION</p> <p>The Portsmouth Gaseous Diffusion Plant (PORTS) was constructed in the early 1950's for the purpose of enriching the fissionable ²³⁵U isotope of uranium from natural uranium to various product concentrations. The PORTS site is a 3714-acre federal reservation in south-central Ohio; located approximately 75 miles south of Columbus, Ohio and 22 miles north of Portsmouth, Ohio. The nearest residential center is the village of Piketon (approximately 1800 population); located approximately five miles northwest of the facility on U.S. Route 23. A total of 392 facilities are currently on the DOE reservation. Of those, 317 are included in the PORTS decontamination and decommissioning (D&D) project. Of the 317 facilities listed, 134 are buildings that will be removed including the three process buildings. In addition to the three very large process buildings the remaining structures consist of extensive support facilities such as a steam plant, electrical switchyards, cooling towers, cleaning and decontamination facilities, water and wastewater treatment plants, maintenance and laboratory facilities, and office buildings. The uranium enrichment program utilizing the gaseous diffusion process produced various hazardous, non-hazardous, and radioactive byproducts. Activities at the site resulted in contamination of equipment, facilities, soil and groundwater with radioactive and hazardous constituents.</p> <p>One of the current missions of the site is to D&D the PORTS process equipment, process buildings, and the other facilities that are auxiliary to the gaseous diffusion process. The facilities will be characterized, the hazardous materials will be abated, the process equipment will be removed and disposed, the structures and auxiliary buildings will be demolished and disposed, and contaminated soils and groundwater under the buildings will be remediated as necessary. These actions will eliminate the potential for future releases of contaminants from the PORTS site in a manner that protects the environment, the on-site worker, and off-site human health.</p> <p>The D&D project will address the entire gaseous diffusion plant (GDP) complex with the largest and most complex components of the project being attributed to the process buildings. The gaseous diffusion process to accomplish the isotope enrichment took place in a cascade of enrichment stages located in three large process buildings with a combined floor space of 90 acres. The largest process building, X-333, covers 33 acres and is 1456 ft by 970 ft. The X-333 process building contains 640 enrichment stages grouped into cells of eight stages per cell. There are eight units of ten cells per unit. The stages include a compressor, converter, cooler inside the converter, control valve, piping with expansion joints, and an electric motor to drive the compressor. The converters are 13 ft in diameter and 25 ft long. The compressors are 18 ft long. The largest pipe has a 54 in diameter. Each cell can be isolated by valves to perform maintenance while the other cells remain in operation. Some of the isolation valves are 16 ft tall.</p> <p>The X-330 process building contains 1100 stages grouped into cells which contain ten stages. There are eleven units of ten cells per unit. The stages are configured as they are in X-333 but are not as large. The largest converters are 16 ft long and 9 ft in diameter and the other components are similarly proportioned. The X-326 process building contains 2280 enrichment stages grouped into 12 stages per cell. There are nine and one half units of 20 cells per unit. The other one half unit is ten cells containing 60 purge cascade stages (six per cell). The equipment is much smaller, has coolers separate from the converters, and uses only four control valves per enrichment cell for interstage flow control. The largest converters are 5 ft in diameter and 11 ft long.</p> <p>In each of the process buildings, the process equipment is on the second (cell) floor. Controls, power transformers, utilities and auxiliary systems are located on the first (operating) floor. The cascade cooling systems, lube and hydraulic oil systems, and the building ventilation systems are noteworthy due to their size. For example, when the cascade was operating, over 4 million lbs of refrigerant coolant circulated between stage coolers and cell condensers. Approximately 250,000 gal of lubricating oil circulated between holding tanks and the compressor bearings. Gas flow between stages was controlled by high-pressure hydraulic control valves. Ventilating air systems included hundreds of supply fans, re-circulating exhaust fans</p>			

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.02	5. WBS ELEMENT TITLE Building and Facility D&D	

and roof exhaust fans to maintain building temperature control.

The remainder of the plant defined as the Balance of Plant (BOP) consists of all utility systems, support structures, and administration buildings. General utilities will be a constantly changing variable during performance of the project and will undergo continual change as the project progresses. These general utilities consist of electrical distributions, tie lines and substations, steam and condensate systems, dry air and nitrogen, water supply lines, sanitary water and sewer systems, recirculating water systems, and fluorine distributions.

Support structures are characterized as industrial and non-industrial facilities, and are broken down into radiological and non-radiological facilities. The identified actions for the BOP facilities are consistent with that of the process buildings and are further outlined in the scope description section.

LOGIC RELATIONSHIPS

The design and construction of the On-Site Waste Disposal Facility (OSWDF) needs to be completed on a schedule that supports D&D of the three process buildings. It is critical for cost effective cleanup of the process buildings to have available on-site waste disposal capacity in a time frame that does not impact the project schedule.

In addition, the schedule of facility demolition will make available the associated deferred units for characterization and remedial action. These activities are planned as subsequent to each building demolition and concurrent with the overall site D&D.

SCOPE DESCRIPTION

The scope of this subproject is to decontaminate and demolish the PORTS, including the X-326, X-330, and X-333 process buildings, utilities and ancillary and support structures. The scope is comprised of project management, preparation of regulatory documents, safety basis and criticality safety documentations, and security documents. Also included are field activities such as characterization, hazardous material abatement, utility isolation, equipment removal, and building demolition. The major project elements of building D&D are:

- Facility characterization
- Junk removal
- Utility Isolation
- Decontamination
- Equipment dismantlement and removal
- Hazardous material abatement (i.e., Asbestos Containing Material [ACM] removal)
- Above ground demolition
- Slab demolition
- Below ground demolition
- Waste management
- Project closeout

The project will utilize the CERCLA non-time-critical removal action process as the regulatory framework for conducting the project. This process involves consideration of alternatives, public involvement, threatened and endangered species, natural resources/wetlands/ecology, archeology/culture, geology/soils/groundwater resources, land use, radiological/non-radiological impacts, surface water/water quality, and environmental permits and regulations. This process will satisfy and be compliant with the National Environmental Policy Act (NEPA) through incorporation of all NEPA values into the methodology.

The first step in demolition is characterization and removal of hazardous materials. Hazardous materials are expected to include ACM in pipe insulation, transite cell housing covers, building siding, and floor tile as well as mercury in instrumentation systems, lights, and switches. Other hazards encountered may be refrigerants, oils, antifreeze, hexavalent chromium, static capacitors, other polychlorinated biphenyl (PCB) residues, lead based paints, and battery acids. Acceptable solid waste will be sent to the OSWDF and liquid waste will be drained and disposed of at appropriate and approved off-site facilities.

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4. WBS ELEMENT CODE PORTS.40.UD.02	5. WBS ELEMENT TITLE Building and Facility D&D	
<p>ACM scope involves the removal of asbestos cement and transite siding, and electrical and instrument cable trays. For example the X-333 has 400,000 ft² of siding, the X-330 has 370,000 ft², and the X-326 Building has 350,000 ft². In addition, there are 290 cell housings with three million ft² of transite siding. The total volume of siding is estimated to be 200,000 ft³ with an estimated additional 2000 ft³ of piping insulation.</p> <p>PCB removal scope involves the removal of 6574 sealed electric capacitors that contain 100% PCB thick (not drainable) oil in X-333 and 4525 in X-330. In addition, there are ventilating system ductwork gasket joints that contain greater than 500 ppm PCBs that requires proper handling and disposition. The volume of gasket material, gutters, collection pipe, and associated clean up materials is estimated to be 800 ft³. Approximately 7000 fluorescent light fixtures that have ballast transformers containing PCBs will be removed from the X-333.</p> <p>Prior to the process equipment being removed, excess equipment and material will be removed from the process building. The X-333 contains approximately 186,000 ft³ of this material, 97% of which is considered potentially contaminated. The X-330 contains 157,000 ft³ of excess equipment and material, 90% of which is considered potentially contaminated. The X-326 process building contains 136,000 ft³, of which 98% of this material is considered potentially contaminated. To the extent practical, excess equipment and miscellaneous property and materials will also be removed from all ancillary and support facilities.</p> <p>Removal of X-326 uranium deposits, hazardous material, and process equipment removal will be accomplished. The process equipment in X-330 and X-333 will not require segmentation and will be transported to the OSWDF. In X-326 some segmentation will be utilized due to criticality considerations. Removal of process equipment consists of unbolting, burning, or otherwise disconnecting the largest pieces or items of gaseous diffusion process equipment and disposal at the OSWDF. Size reduction of the most compact, complicated, or dense items such as converters, compressors, motors, valves, and condensers will not be attempted. These items will be placed in the OSWDF intact. Simple non-complex items such as pipe sections and large tanks will be size reduced using simple compaction or segmentation processes if economical. Items not meeting the OSWDF waste acceptance criteria (WAC) will be disassembled to the minimum extent necessary to meet the disposal WAC at an off-site facility.</p> <p>Buildings, including the slabs, footers, and foundations up to four ft below grade, will be demolished down to and including the slabs and any substructures down to four ft below grade. Debris from this phase will be placed in the OSWDF as allowed by the WAC. Materials generated in this phase that do not meet the OSWDF WAC will be disposed of at appropriate off-site facilities. Waste characterization, segregation, and transport to the OSWDF are included in the scope of this project. A Removal Action Report will be prepared after completion of physical work.</p>		
SAFETY SYSTEMS		
<p>An Integrated Safety Management System (ISMS), based on DOE's ISMS will be implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to all project tasks and activities.</p> <p>The five core functions are: (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The seven guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, and (7) operations authorization.</p>		
SCOPE ASSUMPTIONS		
General		
<ul style="list-style-type: none">• The D&D project will be conducted in compliance with DOE Orders including DOE Order 413.3 and 430.1B.• Any required utility reconfiguration is not included in this WBS element but is assumed to be performed as part of S&M.• Work will be executed by a competitively selected fixed-price contractor.• An independent construction quality assurance contractor will perform oversight of construction activities and will perform verification testing.		

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<ul style="list-style-type: none"> Adequate cleared personnel are available to meet project schedule. No recycling of materials (i.e. steel, concrete, nickel, etc.). No waste will be transuranic waste (exceed 100nCi/g). 		
Environmental, Health, and Safety		
<ul style="list-style-type: none"> ISMS will be used on all phases of the project to ensure that work is performed safely. Safety Basis documents including a Documented Safety Analysis (DSA) will be prepared and implemented. A Nuclear Criticality Safety Analysis (NCSA) will be performed. An Operational Readiness Review (ORR) will be performed prior to physical D&D work. The PORTS project will be conducted as a CERCLA non-time-critical Removal Action per the U.S. EPA/DOE joint D&D Policy of 1995. Certain environmental permits and an environmental impact statement will not be required. PPE required for cell floor walk-downs is coveralls and gloves. Shoe covers are required on steel stairs, walkways and cell housings above the cell floor. 		
Hazardous Material Abatement		
<ul style="list-style-type: none"> Excess equipment and materials will be removed from the process building and disposed of in the OSWDF. Liquids will be drained and disposed of at an approved off-site facility. PCB contaminated building ventilation system ductwork and gaskets will be removed (bulk PCB waste). Sealed electric capacitors containing 100% PCB oil will be removed from the buildings as PCB wastes. Wastes will be characterized for disposal to meet disposal facility WAC. Solid wastes will be packaged and transported to the OSWDF or an appropriate off-site facility. Mixed wastes and liquids not meeting the OSWDF WAC will be disposed of at a licensed off-site facility. 		
Process Equipment Removal		
<ul style="list-style-type: none"> Some equipment in X-326 will contain greater than always safe mass and will require special provisions to address criticality issues. The major equipment has been purged so that there is no significant volume of gaseous uranium compounds in the equipment. No size reduction by crushing, compacting, shredding, shearing, segmenting, and otherwise dismantling will be accomplished unless economic, regulatory, and operational advantages exist. 		
Building Demolition		
<ul style="list-style-type: none"> Following process equipment removal, the three large process buildings will no longer be categorized as nuclear facilities. Decontamination of structures will be limited to that necessary to protect workers and meet the OSWDF WAC. Classified components will be removed before building demolition. Un-cleared workers may perform demolition work. The buildings will be completely demolished including the slabs, foundations, piers, and substructures down to four ft below grade. Basements and tunnels will have their roofs removed and be backfilled. One Removal Action Report will be prepared for the entire project. 		
RISK MANAGEMENT		
<p>The <i>Risk Management Plan for Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant</i> has been prepared and provides the program and methodology that will be used to assess all project risks including those related to building D&D. Those risks will be identified, assessed, handled, and monitored in accordance with this plan.</p>		

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4. WBS ELEMENT CODE PORTS.40.UD.02	5. WBS ELEMENT TITLE Building and Facility D&D	

Identified Risk/Potential Hazards

- Radiological hazards
- Chemical hazards
- Fire hazards
- Compressed gas cylinder hazards
- Indoor air quality hazards

BASIS OF ESTIMATE

This Life Cycle Baseline estimate was prepared for preliminary planning purposes and is considered conceptual in nature. This estimate should be considered between a Class 3 Preliminary and Class 5 Order of Magnitude cost estimate. The estimate was prepared from an approved cost estimating model, which was developed at summary levels based on either actual historical experience for similar work or best engineering judgment. The excavation portion of the estimate required the input of the facility's gross square footage, relationship to deferred unit and historical data to derive estimate values for required soils removal. Unit prices were then applied to associated activities based on facility size, usage, and expected contamination levels.

The basic premise for CD-1 estimates are defined per the "DOE Cost Estimating Guide for Program and Project Management, DOE G 430.1-1X, April 2004." As per the DOE cost estimating guidance the project is at "Critical Decision (CD)-1, Approve Alternative Selection and Cost Range." Cost estimates prepared to support CD-1 will range from Class 5 Order of Magnitude to Class 3 Preliminary cost estimates using several cost estimating techniques.

The five DOE cost estimate classifications are based on AACE's Recommended Practice for Classifying Cost Estimates (AACE International Recommended Practice No. 17R-97; Appendix J). The following table lists all the cost estimating classifications.

Cost Estimate Classifications

Cost Estimate Classification	Primary Characteristics	
	Level of Definition (% of Complete Definition)	Cost Estimating Description (Techniques)
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (Parametric, specific analogy, expert opinion, trend analysis)
Class 4, Intermediate	1% to 15%	Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)
Class 3, Preliminary	10% to 40%	Various, including combinations (detailed, unit-cost, or activity-based; parametric; specific analogy; expert opinion; trend analysis)
Class 2, Intermediate	30% to 70%	Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD		
4. WBS ELEMENT CODE PORTS.40.UD.02		5. WBS ELEMENT TITLE Building and Facility D&D			

SCHEDULE ASSUMPTIONS

- OSWDF capacity is available when needed.
- Characterization and remediation at the "deferred units" will be coordinated with demolition activities.

REQUIREMENTS/DRIVERS

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Toxic Substance Control Act (TSCA)
- Atomic Energy Act of 1954 as amended
- National Environmental Policy Act (NEPA)
- Federal Facilities Compliance Act (FFCA)
- National Historic Preservation Act (NHPA)

WASTE VOLUMES

SourceTag	Description	VOLUME	UOM	WEIGHT	UOM
LLWV	Compressor for X-326	17,542	M3	10,850	TON
LLWV	Compressor for X-330	24,919	M3	15,412	TON
LLWV	Compressor for X-333	26,423	M3	26,331	TON
LLWV	Concrete Slab Waste (LLW)	183,159	M3	569,906	TON
LLWV	Converter for X-326	11,662	M3	1,955	TON
LLWV	Converter for X-330	31,896	M3	15,246	TON
LLWV	Converter for X-333	73,506	M3	73,249	TON
LLWV	LLW Disposal	755,983	M3	1,932,726	TON
LLWV	Motor for X-326	11,927	M3	7,377	TON
LLWV	Motor for X-330	9,968	M3	6,165	TON
LLWV	Motor for X-333	15,658	M3	9,685	TON
MLLV	MLLW Disposal	39,383	M3	79,563	TON
RCRAV	RCRA Disposal	154	M3	629	TON
SANV	Sanitary Waste Disposal	452,666	M3	994,346	TON
TSCAV	Lube oil disposal	920	M3	893	TON
TSCAV	TSCA Disposal	7,394	M3	13,350	TON

PROJECT SCHEDULE

See attached.

BASELINE BY YEAR

See attached Baseline by Year Report.

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03		5. WBS ELEMENT TITLE Waste Disposal	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION CD-1 Approve Alternative Selection and Cost Range		8. DATE TBD
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION Conceptual Design On-Site Waste Disposal Facility		11. PBS ELEMENT NUMBER(s) PBS PO-0040	
<p>INTRODUCTION</p> <p>Decontamination and decommissioning (D&D) of the Portsmouth Gaseous Diffusion Plant (PORTS) will result in the generation of large quantities of contaminated and uncontaminated waste requiring disposal. Waste estimate takeoffs have been developed for building demolition work which demonstrates a total volume of approximately 1.7 million cubic meters of waste requiring disposal. A small quantity of waste will require off-site disposition and will be shipped to DOE approved treatment and/or disposal facilities. The majority of the D&D generated waste (including surveillance & maintenance [S&M] waste) is planned to be disposed of in an on-site waste disposal facility (OSWDF). The OSWDF will also be available to accept wastes associated with PORTS Environmental Management (EM) programs including soils remediation waste generated during the deferred unit (DU) clean-up actions. These units are outlined in the Deferred Units Work Breakdown Structure dictionary and are planned for remediation in conjunction with the building D&D.</p> <p>The OSWDF will be designed, constructed, operated, and closed as a part of the D&D project which will be conducted as a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). All aspects of the OSWDF will be governed by applicable or relevant and appropriate requirements (ARARs) documented in an approved Action Memorandum prepared for the non-time-critical removal action under CERCLA. This is consistent with the agreement between U.S. EPA and DOE which established a tailored approach for decommissioning the DOE's contaminated facilities as non-time critical removal actions. <i>The Policy on Decommissioning of Department of Energy Facilities under the Comprehensive Environmental Response, Compensation, and Liability Act</i> was signed on May 22, 1995 by the Assistant Administrator of the U.S. EPA and by DOE's Assistant Secretary for EM.</p> <p>The planned OSWDF will provide waste disposal capacity for low level radioactive waste (LLW) as defined by the Atomic Energy Act of 1954 as amended, hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA), waste regulated under Toxic Substances Control Act (TSCA), and mixed waste (combinations of LLW/TSCA or LLW/RCRA). Predominant waste receipts are expected to be process equipment and debris from building demolition. Classified waste is also considered for some of these waste types and will also be evaluated during design for requirements definition.</p> <p>LOGIC RELATIONSHIPS</p> <p>Design and construction of the OSWDF will be sequenced so that initial operational capacity is available when major process equipment removal and D&D activities are initiated. Phased construction of the OSWDF will be scheduled to assure that capacity is available when waste is generated.</p> <p>Also logically linked to the OSWDF requirements are the soils that will be generated as part of the remediation activities in support of the deferred unit clean-up. These soils could serve to assist in placement needs for fill of void space and compaction.</p> <p>SCOPE DESCRIPTION</p> <p>Design and Construction Considerations:</p> <p>The OSWDF will be designed, constructed, and operated to accept waste generated as a part of asbestos abatement, process equipment removal, facility dismantlement, and soil and building slab removal. General types of waste generated for disposal would be low level radiological waste, RCRA waste, TSCA waste, non-hazardous solid waste and mixtures of these waste</p>			

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	
<p>types, as well as, classified waste. The planned OSWDF shall consist of one or more RCRA compliant earthen disposal cells of sufficient volume to contain the expected volume of waste. Siting studies will be performed to determine the optimal site on the reservation based on many factors including cost, geology, geography, soils, and existing contamination. Also included are those items necessary to transport, stage, store, and secure items for disposal, as well as, provision for borrow or fill materials for placement of material, continued construction activities and final capping and closure of the OSWDF. Conceptual Design requirements and drawings are outlined in the <i>Conceptual Design Report for the Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Project TPMC/PORTS -81</i> (CDR), under section 9.16.6 <u>Site Plans and Drawings</u>.</p>		
<p>The OSWDF will be sized for approximately 1.7 million cubic meters of solid waste that will be generated during D&D of the site. A previous assessment conducted at the site in June of 2002, entitled <i>Preliminary Assessment for a Potential On-Site Waste Disposal Facility at the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio</i>, assumed a waste-to-soil ratio of 20% waste volume to 80% soil volume. This report used a preliminary estimate of 1.9 million m³ of debris to determine the need for a 9.2 million m³ landfill. This is a reasonable assumption due to the need to quickly cover, contain, and compress D&D wastes that may purposefully (to reduce worker risk and cost) receive little or no in-place compaction. The preferred scenario for building demolitions assumes the large gaseous diffusion process converters and compressors will be placed into the OSWDF without size reduction and without filling the interior void spaces. These converters will be identified in the Waste Generation forecast and it is assumed that disposal cells will be added incrementally based on those forecasts. In addition to the GDP equipment used in the uranium enrichment process, other solid waste disposed in the OSWDF will predominately consist of:</p> <ul style="list-style-type: none">• Concrete from floor slabs, pads, basements, and building material;• Demolition debris for building demolition containing wood, siding, gypsum, roofing material, etc.;• Scrap metal such as metal towers, non-process equipment, and cranes;• Soil including sediments and soil-like materials such as carbon filter;• Asbestos including porous insulation, transite, building siding, and tiles; and• Dry solids which includes other waste such as trash from building cleanouts prior to demolition.		
<p>The site for the OSWDF has not been established, but several PORTS reservation areas or locations within the perimeter of the site are considered candidates based on geology, geography, soils, and existing contamination. Although there is a considerable amount of existing subsurface and groundwater monitoring information, any site selected at PORTS will need additional site specific information to conduct a thorough analysis of the site to more fully address and mitigate potential environmental impacts during construction. Nevertheless, general site conditions suggest the PORTS facility offers suitable conditions for construction of the OSWDF without major impacts upon natural and cultural resources or the local population and economic conditions. The Environmental Assessment (EA) completed for a previous PORTS landfill in 1995, <i>Environmental Assessment, Construction and Operation of an Industrial Solid Waste Landfill at Portsmouth Gaseous Diffusion Plant, Piketon, Ohio, October, 1995</i>, DOE/EA 076, supported issuance of a Finding of No Significant Impact (FONSI) and likewise supports this conclusion.</p>		
<p>As the final site is selected site buffer area boundaries are determined, and spatial limitations identified, the following engineering determinations, and plans will be developed prior to starting a drilling program on the selected site. These documents will support the advancement of the design through the preliminary and final design phases:</p> <ul style="list-style-type: none">• Landfill footprint – to determine number and locations of borings;• Landfill liner grades – to determine the depth of borings;• Depth to aquifer for groundwater monitoring – to determine depth and locations of piezometers;• General operation plan and footprint – to check interaction of all components;• Stormwater and sedimentation system location – to locate borings;• Borrow soil locations – to locate borings;• Boring and piezometer plan – discussion of this with regulators may be needed;• Field sampling and testing plan – discussion of this with regulators may be needed;• Lab testing plan – discussion of this with regulators may be needed; and• Groundwater monitoring plan – discussion of this with regulators may be needed.		
<p>Ultimately the selected site of the OSWDF will be based on an assessment of existing and new data generated as activities progress. All data generated shall consider compliance with site selection criteria developed during the CERCLA Engineering Evaluation/Cost Analysis (EE/CA) process, local public, and regulatory stakeholder inputs.</p>		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	

Site selection includes checking the proposed site to identify any buffer boundary or other limitations and unusable areas or areas with limitations such as:

- Distance from the majority of D&D activities and borrow soil sources;
- Significant elevation changes;
- Unstable areas;
- Flood areas and water bodies;
- Proximity to valuable natural and cultural resources;
- Site visibility to the public;
- Areas close to dwellings, schools, public wells, and private wells; and
- Roads, railroad, and public utilities.

Waste Acceptance Criteria (WAC) for the PORTS OSWDF will require negotiation and approval and cannot be established prior to approval of the preferred alternative. Therefore, the OSWDF conceptual design must be based on assumptions related to the future WAC for the facility. The completed OSWDF WAC will be developed and supported by evaluations and studies developed after Critical Decision-1 (CD-1) Conceptual Design Approval/Cost Range. Some examples are as follows:

- PORTS D&D EE/CA
- OSWDF Performance-Based Design Modeling
- Nuclear Criticality and Safety Evaluation
- WAC Attainment Implementation Plan

These evaluations, assessments, and findings will be considered and included in the final design documentation.

Operational Considerations:

This conceptual design assumes the PORTS OSWDF will accept wastes similar to the Oak Ridge Environmental Management Waste Management Facility (EMWMF), with the exception of the limitation requirements for fill to waste void volumes in process equipment. Based upon assessment of anticipated PORTS D&D waste types, the EMWMF WAC is a reasonable basis for disposal in the OSWDF. Further analysis is provided in the CDR regarding PORTS assumptions for void volumes and fill requirements.

It is assumed that the waste types and categories will be consistent with those specified in the; *Waste Management Plan for the Portsmouth Gaseous Diffusion Plant, Piketon, Ohio, TPMC/PORTS-60*, for example:

- Low-level radioactive waste (LLW)
- Mixed LLW and RCRA
- Mixed LLW and TSCA
- RCRA Hazardous Waste
- Industrial Sanitary Waste
- Classified

The following table demonstrates the D&D waste types and quantities planned for placement in the PORTS OSWDF:

SourceTag	Description	Quantity	UO M
LLW	LLW volume	1,162,644	M3
MLL	MLLW volume	39,383	M3
RCRA	RCRA volume	154	M3
SANI	Sanitary volume	452,666	M3
TSCA	TSCA volume	8,314	M3
TOTALS		1,663,161	M3

NOTE: The waste forms defined within these categories are asbestos, concrete, demolition debris, dry solids, process equipment, scrap metal, and soil.

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	

The table does not include the planned soils to be generated during the DU remediation. The estimated quantity of soils from the DU remediation is approximately .4 million m³. These soils will be used as placement and void space fill in and around equipment and debris for proper compaction. It is not anticipated that soil placement in this manner will increase cell capacity requirements. The combined total volume will equal approximately 2.16 million m³ of material placed. Additional details and waste tables can be found both in the estimate documentation and in the CDR.

The OSWDF will operate under controls that will be developed for landfill requirements such as:

- Waste placement,
- waste transport from D&D ongoing actions,
- stormwater management,
- primary leachate management and secondary leachate management,
- waste/soil compaction,
- dust control,
- nuclear criticality control,
- health and safety,
- security,
- operations equipment/facility needs and use, and
- closure.

Specified and approved plans will be developed to accommodate the operational requirements needed to assure protection of workers, the public, and the environment. These plans will encompass the desire to achieve maximize operational efficiency within the framework. The operational plans will be developed during the CERCLA process with public and regulatory agency participation and acceptance. A detailed outline in table format is provided in the CDR for operational requirements; this can be found in sections 9.16.7 Landfill Operational Requirements. Although post-closure care will be planned under this action, it will be implemented through the DOE Legacy Management Program.

As previously stated, the WAC for the PORTS OSWDF will require negotiation and approval and cannot be established prior to approval of the preferred alternative. The OSWDF conceptual design and subsequent operation must be based on assumptions related to the future WAC for the facility.

In support of the compliance requirements for the final approved WAC, a Waste Acceptance Organization or Board will be established to verify that waste streams being transported to the OSWDF are compliant with the WAC requirements. Operational procedures and protocols will be developed as part of the organizational responsibilities to ensure integration, communications, and compliance among all activities performed as part of the D&D project that will require access to the OSWDF.

Liquid waste, transuranic waste, RCRA waste exceeding land disposal restrictions, United States Enrichment Corporation (USEC) and Uranium Disposition Services (UDS) generated waste, and waste generated off-site will not be disposed of in the OSWDF.

SAFETY SYSTEMS

An Integrated Safety Management System (ISMS), based on DOE's ISMS will be implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to all project tasks and activities.

The five core functions are: (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The seven guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, and (7) operations authorization.

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	

SCOPE ASSUMPTIONS

Project assumptions are documented in the CDR. They are also listed here in support of the scope, schedule and estimate. The prevailing assumption for this element, as well as the overall PORTS D&D project, is that design, construction, operation, closure/post-closure care, regulator interaction, and public/other stakeholder participation will be accomplished through the CERCLA non-time-critical removal action process. Consistent with CERCLA, no permits will be required.

Design and Construction

- The landfill will accept LLW, RCRA, TSCA waste separately or in mixtures of each type. It also will accept classified waste. The landfill will not accept transuranic wastes, RCRA Land-Banned waste, and liquid wastes.
- The landfill will accommodate 1.7 million m³ of waste; additional soil will be required at a ratio of 4-parts soil to 1-part waste debris. This would result in a final cell volume of approximately 8.4 million m³.
- Design assumptions are based on the liner and cover used at the Fernald, Ohio DOE site. This liner and cover meets the State of Ohio's requirements for a hazardous waste landfill and includes a bio-intrusion layer.
- The landfill liner will essentially be at existing grade. The liner grades utilized for the conceptual design are the minimum grades allowed for a sanitary waste landfill in Ohio (2% on floor slopes and 0.5% along leachate collection lines) plus an additional 0.5% in grade (a total of 2.5% on floor slopes and 1.0% along leachate collection lines) to account for settlement due to landfill loading.
- The final cover grades utilized for the conceptual design are the minimum grades allowed for a sanitary waste landfill in Ohio (5%) plus an additional 5% in grade to account for settlement within the waste mass. This relatively flat cover should increase landfill stability, decrease contaminant risk determined by risk-based modeling, and facilitate waste placement access during operations.
- Leachate collection from both the primary and secondary systems will be achieved by pumping from sumps within the landfill liner. Liner penetrations are not planned because they present more long-term problems than landfill sumps. The pipe penetrations are also thought to be less reliable during earthquake loading conditions.
- Each landfill cell has primary and secondary leachate collection systems that are independent from the collection systems of other cells and would, if necessary, allow segregation of leachate from different cells.
- Each cell is also structurally independent from other cells because it is surrounded by a berm that would, if necessary, allow closure of an individual cell and would tend to minimize the risk of leachate overflowing past the cell boundary. This separation of cells could also be used to separate waste types.
- The landfill solid waste boundary will occupy a rectangular footprint measuring 1,900 ft by 3,000 ft for a total of just over 130 acres. A buffer of about 200 ft will be needed outside the solid waste boundary to contain the access road around the outside of the landfill along with its stormwater drainage ditches for a total of about 170 acres. Interior security fencing these 170 acres would include about 12,000 ft of fencing, while exterior security fencing would include about 15,000 ft around 340 acres of landfill support areas that would include a wastewater treatment plant, scale house, staff facilities, equipment building, and a temporary waste holding area. The landfill access road around the perimeter of the assumed landfill footprint would have a length of about 11,000 ft.
- The landfill haul road will be a dedicated road of an assumed 4,400 ft in length.
- A stormwater system is estimated based on a 10-acre single-lined contact-water basin and a 20-acre soil-lined sedimentation basin. The contact-water basin and sedimentation basin will be inside the exterior fence at identified locations to allow maximum benefit to operations.
- A leachate management system assumes a 300,000-gal dual-lined leachate collection basin located inside the exterior security fence at a convenient location for operations.

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	
<ul style="list-style-type: none">Incoming D&D wastes will have a significant amount of void space that will require special handling in the disposal areas. Waste placement techniques are proposed to minimize the effects of waste settlement due to these voids.Additional soils will be placed over the liner before certain waste types are placed or before certain equipment can travel over this liner. Additional drainage soils will be placed as needed during waste placement activities to ensure proper drainage away from and around placed waste.An earthquake with a peak bedrock acceleration of 0.095 g (% of gravity) has a 2% probability of exceedance during a 50-year period that can be easily resisted due to the use of a textured geomembrane, the liner and the cover, and a relatively large structural-fill toe berm.A biointrusion layer on outside berm is assumed to minimize long-term erosion. Long-term erosion will also be limited by the relatively flat (for landfills) final cover.The facility will be categorized as Radiological.Detail design and construction will be performed by a fixed price subcontractor.Conceptual Design will be provided to the design/construction contractor.Construction of collection basins, on-site support facilities, security features, and any needed haul roads are included.Construction schedule will support waste shipments to the OSWDF as defined in the waste generation forecast.Phased Construction Completion Reports will be used to document completion of phased disposal cell additions.A Construction Completion Report will be prepared when OSWDF final capacity is achieved.		
Operations		
<ul style="list-style-type: none">The WAC is specified in the overall Waste Management Plan.A Waste Acceptance Organization will be in place to assure compliance with the WAC requirements.Site security and access control will be maintained through an approved Safeguards and Security Plan.Quality Control and Quality Assurance Program will be developed.Radiological control technicians will survey personnel and equipment exiting the controlled areas at the OSWDF.Sampling and analysis of waste streams for WAC compliance will occur at the generating site, within the remediation site, or at the staging area.Transportation to the OSWDF will be provided by the generating project.Maintenance and any needed improvements of equipment, and facilities within the OSWDF site boundary are included in this element.Location (x, y, and z coordinates) and dates of placement of the various waste streams within the OSWDF will be documented.Contaminated soil will be used to fill voids to the extent possible.Certifications of disposal will be prepared upon disposal of waste.		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	

- Placement of daily/interim cover will be defined in an Operations Plan.
- Environmental monitoring and performance monitoring will be specified in an Operations Plan.

Facility Closure

- Final capping of the OSWDF will occur when the project is completed.
- Ongoing operations of leachate collection system and long term monitoring.

RISK MANAGEMENT

The *Risk Management Plan for Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant* has been prepared and provides the program and methodology that will be used to assess all project risks including those related to the OSWDF. Those risks will be identified, assessed, handled, and monitored in accordance with this plan.

BASIS OF ESTIMATE

Methodology for cost evaluation of disposal cost for the PORTS OSWDF is based on the historical Life Cycle Cost Analysis (LCCA) of other similar disposal sites (on-site disposal facilities under CERCLA). As presented in table below, various facilities were compared based on the disposal facility type (on-site or off-site), CERCLA or non-CERCLA and type of waste accepted. These categories were used to set a basic parameter for further cost evaluation.

Sites Evaluated for On-Site Disposal Facility Analysis	
Facilities Used for Estimating Disposal Cost	
	Fernald OSDF
	INEEL ICDF
	Oak Ridge EMWMF
	Weldon Spring

The preliminary estimates for this project are parametric in nature and are based on experience at other DOE Facilities as identified above, where similar actions, waste type, quantities and requirements are known. As the project progresses and parameters are defined for the PORTS OSWDF final location, WAC, and performance objectives are established, detailed, "bottoms-up" estimates will be developed and incorporate the known requirements.

The basic premise for CD-1 estimates are defined per the "*DOE Cost Estimating Guide for Program and Project Management*, DOE G 430.1-1X, April 2004." As per the DOE cost estimating guidance the project is at "*Critical Decision (CD)-1, Approve Alternative Selection and Cost Range*." Cost estimates prepared to support CD-1 will range from Class 5 Order of Magnitude to Class 3 Preliminary cost estimates using several cost estimating techniques.

The five DOE cost estimate classifications are based on AACE's Recommended Practice for Classifying Cost Estimates (AACE International Recommended Practice No. 17R-97; Appendix J). The following table lists all the cost estimating classifications.

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.03	5. WBS ELEMENT TITLE Waste Disposal	

Cost Estimate Classifications		
Cost Estimate Classification	Primary Characteristics	
	Level of Definition (% of Complete Definition)	Cost Estimating Description (Techniques)
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (Parametric, specific analogy, expert opinion, trend analysis)
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Class 2, Intermediate	30% to 70%	Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)

SCHEDULE ASSUMPTIONS

- Timing for adding disposal cells is based on the waste generation forecast.
- Each disposal cell will be completed three months before capacity is required.
- OSWDF operation will be performed on day shift.
- Workforce with required skills and appropriate level of security clearance are available to support the schedule.

REQUIREMENTS/DRIVERS

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
- Resource Conservation and Recovery Act (RCRA)
- Toxic Substance Control Act (TSCA)
- Atomic Energy Act of 1954 as amended

WASTE VOLUMES

Waste forecasts are represented in each individual project generating the waste.

PROJECT SCHEDULE

See attached.

BASELINE BY YEAR

See attached Baseline by Year Report.

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.04		5. WBS ELEMENT TITLE Environmental Remediation Deferred Units	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION CD-1 Approve Alternative Selection and Cost Range		8. DATE TBD
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION Conceptual Design Deferred Units Remediation		11. PBS ELEMENT NUMBER(s) PBS PO-0040	
<p>INTRODUCTION</p> <p>The existing PORTS Environmental Management Program is subject to a Resource Conservation and Recovery Act (RCRA)-based Consent Decree from the State of Ohio and a RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) based Administrative Consent Order (ACO) with the U.S. Environmental Protection Agency (U.S. EPA). The Consent Decree and ACO were both initially signed in 1989. The Consent Decree and ACO govern environmental cleanup efforts at PORTS, set mandatory schedules, define additional roles and responsibilities, and determine penalties. The Consent Decree and ACO are administered by the Ohio Environmental Protection Agency (Ohio EPA) with limited oversight by U.S. EPA Region V.</p> <p>During the RCRA Facility Investigations (RFIs) mandated by the Consent Decree, certain PORTS facilities (both structures and environmental units) were determined to be inaccessible for characterization due primarily to the operations ongoing in the facilities at the time. Between 1997 and 1998, the U.S. EPA, Ohio EPA, and DOE agreed to a strategy whereby the remediation of the environmental media beneath and surrounding 45 facilities, was deferred to deactivation and decommissioning (D&D), referred to herein as "Deferred Units (DU)."</p> <p>Remediation efforts at most of the major gaseous diffusion plant facilities were deferred until the facilities were no longer needed for ongoing operations. In order to complete the decision-making process for the solid waste management units (SWMUs) associated with these GDP facilities, a supplemental sampling and a separate corrective measures evaluation process will be conducted as D&D activities progress. The scope of this characterization and remediation work is limited to the environmental media beneath and around those facilities. DOE intends to manage activities associated with remediation of soil and groundwater within the Consent Decree/ACO regulatory environment. The desired end point of the remediation of each DU is No Further Action (NFA).</p> <p><i>(Reference and INSERT MAPS OF QUADRANT DU LOCATIONS as Attachments)</i></p> <p>LOGIC RELATIONSHIPS</p> <p>This project has a direct relationship with the PORTS D&D activities. The DUs are physically located under and in proximity to existing structures that preclude characterization and remediation activities. When structures are removed as a result of D&D activities, the DUs will become accessible for characterization and any necessary remediation.</p> <p>In addition, DU remediation has a logical relationship with the construction and operation of the planned PORTS On-Site Waste Disposal Facility (OSWDF). The intended destination for contaminated soils removed during DU remediation is the OSWDF. Furthermore, as D&D activities increase, the soil requirements will multiply to meet the need for compaction material necessary to address void space requirements in placement of demolition waste debris and equipment. The DUs will not be accessible for characterization and remediation until the D&D activities have commenced and the OSWDF is constructed.</p> <p>Therefore, a logical sequence of activities for building removal that will allow access to needed soils that can be gained during DU remediation is critical in the sequence for building removal and the waste placement, compaction, and cover schedule for the OSWDF.</p> <p>SCOPE DESCRIPTION</p> <p>To achieve the ultimate goal of NFA, the following sequence of activities will be performed for each of the DUs (a list of the DUs is provided in the Basis of Estimate section of this document).</p>			

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.04	5. WBS ELEMENT TITLE Environmental Remediation Deferred Units	
<ul style="list-style-type: none">• Planning Documents• Characterization• Corrective Measures Study (CMS) and Preferred Plan• Field Activities• Verification and Closure Documentation <p>Prior to beginning characterization activities, environmental media data from the RFI shall be reviewed, along with site activities that have been performed since the original CMS were conducted that identified these units. This is necessary to verify the extent of additional characterization required. Additional characterization shall be performed as needed to delineate and define the extent of soil remediation.</p> <p>For those sites requiring additional data collection, as well as sites without RFI data, plans will be developed to conduct site investigations. The work plans will require approval by Ohio EPA and will include but may not be limited to the following:</p> <ul style="list-style-type: none">• Health & Safety Plan• Sampling Plan• Quality Assurance Plan• Data Management Plan <p>Field activities will vary depending on the characterization requirements. Typical characterization for the deferred units will include:</p> <ul style="list-style-type: none">• Soil sampling• Groundwater sampling <p>The RFI/CMS shall be prepared upon completion of the characterization activities. The report shall include a summary of analytical results and comparison against the established Preliminary Remediation Goals (PRGs). For concentrations exceeding PRGs, the CMS documents shall include a plan to remediate on-site soils and groundwater to within acceptable levels.</p> <p>Following the characterization and CMS process, selected alternatives shall be designated as the Preferred Plan and Corrective Measures Implementation (CMI) shall be performed in a timely fashion. The following corrective actions will be performed as appropriate and required:</p> <ul style="list-style-type: none">• Soil Remediation• Groundwater Remediation• Environmental Restoration• Final Report/Closure Documentation <p>Soil remediation to identified areas will include excavation, transportation, and disposal of all waste into an existing OSWDF. Soil shall be removed, when necessary, to the extent defined in the Preferred Plan based on the results of the characterization. Upon completion of soil removal activities, soil samples shall be collected to verify remediation to within acceptable concentrations. No backfilling shall be performed until the analytical results of the verification samples have been obtained. The excavation shall be covered and secured to minimize soil contact with storm water runoff. Any liquids collected from the excavation while awaiting sample results shall be handled in accordance with regulatory policies and procedures.</p> <p>Environmental restoration includes the backfilling and compaction of all disturbed areas to be restored to match existing site grades. Care shall be taken to insure that site drainage is maintained throughout all remediation activities.</p> <p>Upon completion of remediation activities for DUs covered by the RCRA Ohio Consent Decree and U.S. EPA ACO, a final report (e.g., CMI Closure Report, Final Progress Report) shall be prepared and submitted for review by DOE. The report shall be prepared in accordance with Ohio EPA standards and shall detail the activities of the remediation actions. It shall be of sufficient detail to provide Ohio EPA with information necessary to obtain a NFA for the site.</p>		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.04	5. WBS ELEMENT TITLE Environmental Remediation Deferred Units	

SAFETY SYSTEMS

An Integrated Safety Management System (ISMS), based on DOE's ISMS will be implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow down to all project tasks and activities.

The five core functions are: (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The seven guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, and (7) operations authorization.

SCOPE ASSUMPTIONS

- The project will be conducted in compliance with DOE Orders including DOE Order 413.3.
- Any needed utility reconfiguration is not included in this scope.
- Work will be executed by a competitively selected fixed price contractor.
- An independent construction quality assurance contractor will perform oversight of construction activities and will perform verification testing.
- Adequate cleared personnel are available to meet project schedule.
- No waste will be transuranic waste (exceed 100nCi/g).
- Characterization and remediation of deferred units will be conducted under the existing Consent Decree/ACO or, if these documents are amended or superseded by new directives from Ohio/federal regulatory agencies, the requirements for the process of accomplishing work at the deferred units will remain the same.
- Soil sampling can be accomplished prior to building demolition to give an earlier estimate of the remediation scope.
- All physical facilities, including subsurface foundations to 4 ft below grade and utilities, will have been removed prior to performance of characterization or remediation.
- Number of soil borings estimated based upon a 100 ft grid interval over estimated DU footprint.
- Soil samples to be collected from surface and every 5 ft. No soil samples collected below water table (assumed to be 16 ft below grade).
- Number of samples includes soil, groundwater (from existing monitoring wells only) and 10% QA/QC sample allowance.
- Soil volume estimated based upon footprint of facility, plus 5 ft buffer beyond perimeter. Extent of soil removal is based upon type of facility and known information provided through RFI/CMS. Extent of soil removal is provided in Table 1.
- All waste is low-level rad and F001 organic contaminated meeting Land Disposal Requirements (LDR).
- All solid waste generated by DU characterization and remediation will meet the OSWDF WAC
- Extraction wells shall be piped to existing X-627 Treatment Facility.
- The WAC for the on-site landfill is assumed to include RCRA wastes, classified wastes, sanitary wastes, mixed waste, low level radioactive waste, and TSCA wastes.
- No additional sources of groundwater contamination will be identified and the current remedial action in place will continue to operate throughout the D&D schedule.
- Specific characterization and remediation assumptions are provided in Table 1 in the Basis of Estimate section.
- Scope and Schedule for characterization and remediation of the DUs under the Consent Decree/ACO will be consistent with and not impede the Building D&D being conducted under the EE/CA and Action Memorandum.

RISK MANAGEMENT

The *Risk Management Plan for Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant* has been prepared and provides the program and methodology that will be used to assess all project risks including those related to the DUs. DU risks will be identified, assessed, handled, and monitored in accordance with this plan.

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.04	5. WBS ELEMENT TITLE Environmental Remediation Deferred Units	

BASIS OF ESTIMATE

This Life Cycle Baseline estimate was prepared for preliminary planning purposes and is considered conceptual in nature. This estimate should be considered between a Class 3 Preliminary and Class 5 Order of Magnitude cost estimate. The estimate was prepared from an approved cost estimating model, which was developed at summary levels based on either actual historical experience for similar work or best engineering judgment. The excavation portion of the estimate required the input of the facility's gross square footage, relationship to deferred unit and historical data to derive estimate values for required soils removal. Unit prices were then applied to associated activities based on facility size, usage, and expected contamination levels.

The basic premise for CD-1 estimates are defined per the "DOE Cost Estimating Guide for Program and Project Management, DOE G 430.1-1X, April 2004." As per the DOE cost estimating guidance the project is at "Critical Decision (CD)-1, Approve Alternative Selection and Cost Range." Cost estimates prepared to support CD-1 will range from Class 5 Order of Magnitude to Class 3 Preliminary cost estimates using several cost estimating techniques.

The five DOE cost estimate classifications are based on AACE's Recommended Practice for Classifying Cost Estimates (AACE International Recommended Practice No. 17R-97; Appendix J). The following table lists all the cost estimating classifications.

Cost Estimate Classifications

Cost Estimate Classification	Primary Characteristics	
	Level of Definition (% of Complete Definition)	Cost Estimating Description (Techniques)
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (Parametric, specific analogy, expert opinion, trend analysis)
Class 4, Intermediate	1% to 15%	Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)
Class 3, Preliminary	10% to 40%	Various, including combinations (detailed, unit-cost, or activity-based; parametric; specific analogy; expert opinion; trend analysis)
Class 2, Intermediate	30% to 70%	Various, more definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD			
4. WBS ELEMENT CODE PORTS.40.UD.04	5. WBS ELEMENT TITLE Environmental Remediation Deferred Units				
Table 1. Deferred Unit List and Assumptions					
Deferred Unit	Characterization		Remediation		
	Estimated No. Borings	Estimated No. Samples	Estimated Soil Removal Extent	Estimated Volume of Soil (cy)	Estimated Volume of Soil (cm)
X-770 Mechanical Testing Facility	12 @ 16 ft.	58	30% of area to 8 ft. depth	2136	1633
X-705A Radioactive Waste Incinerator/X-705B Contaminated Burnables Storage Lot	8 @ 16 ft.	38	50% of area to 6 ft. depth	423	323
Soils in the Vicinity of the X-720 Neutralization Pit	8 @ 16 ft.	38	50% of area to 16 ft. depth	184	141
X-342C Waste HF (Hydrogen Fluoride) Neutralization Pit	4 @ 6 ft.	9	2% of area to 4 ft. depth	12	9
X-344C HF Storage Facility	2 @ 6 ft.	7	2% of area to 4 ft. depth	8	6
X-342B Fluorine Storage Building	1 @ 16 ft.	5	1% of area to 4 ft. depth	3	2
X-626-1 Recirculation Cooling Water Pump House and X-626-2 Cooling Tower	4 @ 16 ft.	20	5% of area to 8 ft. depth	383	293
X-633 Recirculating Water Pump House and Cooling Towers	20 @ 16 ft.	94	5% of area to 8 ft. depth	1715	1311
Remaining X-701C Process Line	4 @ 16 ft.	18	20% of area to 10 ft. depth	116	89
X-630-1 Recirculating Water Pump House, X-630-2 A and B Cooling Towers	8 @ 16 ft.	38	5% of area to 8 ft. depth	754	576
X-630-3 Acid Handling Station	1 @ 16 ft.	5	1% of area to 4 ft. depth	3	2
Chemical and Petroleum Containment Basins (east of X-533A) and Emergency Containment Tanks	3 @ 16 ft.	15	2% of area to 8 ft. depth	25	19
X-720 Maintenance Building	12 @ 16 ft.	57	20% of area to 8 ft. depth	17510	13387
X-744N, P, and Q Warehouses associated with Old Construction Headquarters	6 @ 16 ft.	30	2% of area to 2 ft. depth	80	61
X-7725 Recycle and Assembly Building	8 @ 16 ft.	39	5% of area to 2 ft. depth	1579	1207

1. PROJECT TITLE/PARTICIPANT		2. DATE		3. IDENTIFICATION NUMBER		
Portsmouth Deactivation & Decommissioning (D&D)		TBD		TBD		
4. WBS ELEMENT CODE		5. WBS ELEMENT TITLE				
PORTS.40.UD.04		Environmental Remediation Deferred Units				
Transformer Cleaning/Storage Pad	4 @ 16 ft.	19	20% of area to 8 ft. depth	1046	800	
X-600 Coal Fired Steam Plant	8 @ 16 ft.	37	5% of area to 4 ft. depth	95	73	
X-600A Coal Pile Yard	12 @ 12 ft.	42	5% of area to 4 ft. depth	1485	1135	
X-621 Coal Pile Runoff Treatment Facility	0	0	0	0	0	
X-700 Chemical Cleaning Facility (Soils Only)	8 @ 16 ft.	40	5% of area to 8 ft. depth	1917	1466	
7-Unit Groundwater Area	8 @ 34 ft.	33	0	288	220	
X-326 Process Building	64 @ 16 ft.	289	25% of area to 12 ft. depth	144043	110129	
X-330 Process Building	64 @ 16 ft.	289	25% of area to 12 ft. depth	159363	121842	
X-530A Switchyard, X-530B Switch House, X-530C Test and Repair Building, X-530D Oil House, X-530E Valve House, X-530F Valve House, X-530G Gas Centrifuge Enrichment Plant (GCEP) Oil Pumping Station	40 @ 16 ft.	182	20% of area to 4 ft. depth	23744	18154	
X-745C West Cylinder Storage Yard	12 @ 16 ft.	55	2% of area to 4 ft. depth	1759	1345	
X-333 Process Building	64 @ 16 ft.	289	25% of area to 12 ft. depth	160552	122751	
X-342A Feed Vaporization and Fluorine Generation Building	10 @ 12 ft.	35	10% of area to 4 ft. depth	222	170	
X-533A Switchyard, X-533B Switch House, X-533C Test and Repair Building, X-533D Oil House and Associated French Drains, X-533E Valve House, X-533F Valve House, X-533H Gas Reclaiming Cart Garage	40 @ 16 ft.	182	20% of area to 4 ft. depth	23605	18047	
X-745B Enrichment Process Gas Yard	20 @ 12 ft.	69	2% of area to 4 ft. depth	603	461	
X-747H Northwest Surplus and Scrap Yard	12 @ 16 ft.	55	20% of area to 4 ft. depth	8182	6256	
X-230K South Holding Pond	12 @ 4 ft.	27	25% of area to 2 ft. depth	4972	3801	
X-2230M Southwest Holding Pond	6 @ 4 ft.	14	10% of area to 2 ft. depth	425	325	

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4. WBS ELEMENT CODE PORTS.40.UD.04		5. WBS ELEMENT TITLE Environmental Remediation Deferred Units					
X-705 Decontamination Building (Soils Only)		20 @ 8 ft.	71	75% of area to 6 ft. depth	15378	11757	
X-230J7 East Holding Pond and Oil Separation Basin		12 @ 4 ft.	27	75% of area to 2 ft. depth	2477	1894	
East Drainage Ditch		8 @ 4 ft.	18	50% of area to 2 ft. depth	1056	807	
Little Beaver Creek		16 @ 4 ft.	36	50% of area to 2 ft. depth	6542	5002	
X-230J3 West Environmental Sampling Building and Intermittent Containment Basin		6 @ 12 ft.	22	10% of area to 4 ft. depth	13	10	
X-230J5 West Holding Pond and Oil Separation Basin		4 @ 4 ft.	9	50% of area to 2 ft. depth	389	297	
X-2230N West Holding Pond		6 @ 4 ft.	14	10% of area to 2 ft. depth	248	190	
West Drainage Ditch		12 @ 4 ft.	27	25% of area to 2 ft. depth	1662	1271	
X-230J6 Northeast Holding Pond, Monitoring Facility, and Secondary Oil Collection Basin		4 @ 4 ft.	9	50% of area to 2 ft. depth	330	252	
Big Run Creek		6 @ 4 ft.	14	25% of area to 2 ft. depth	767	586	
X-230L North Holding Pond, and Unnamed Construction Fill Area		6 @ 4 ft.	14	50% of area to 2 ft. depth	14641	11194	
Northeast Drainage Ditch		4 @ 4 ft.	9	25% of area to 2 ft. depth	296	226	
North Drainage Ditch		12 @ 4 ft.	27	25% of area to 2 ft. depth	1766	1350	
TOTALS		2,425			602,797*	460,871*	

* All remediation soils can be used as disposal cell fill and will not increase the waste volume of the cell

SCHEDULE ASSUMPTIONS

- OSWDF capacity is available when needed.
- D&D activities will occur on schedule.
- DU activities will not conflict with other plant activities and field activities can proceed when D&D of each subject facility is completed.
- Schedule requirements defined in the Consent Decree/ACO will not conflict with, or adversely impact, D&D work performed under CERCLA non-time-critical removal action process (EE/CA and Action Memorandum).

REQUIREMENTS/DRIVERS

- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)
- Resource Conservation and Recovery Act (RCRA)

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.04	5. WBS ELEMENT TITLE Environmental Remediation Deferred Units	
<ul style="list-style-type: none">• Toxic Substance Control Act (TSCA)• Atomic Energy Act of 1954 as amended• Ohio Consent Decree• U.S. EPA Administrative Consent Order		
WASTE VOLUMES		
See DU list in Basis of Estimate.		
PROJECT SCHEDULE		
See attached.		
BASELINE BY YEAR		
See attached Baseline by Year Report.		

**U. S. DEPARTMENT OF ENERGY
WORK BREAKDOWN STRUCTURE DICTIONARY
PART II - ELEMENT DEFINITION**

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05		5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	
6. INDEX LINE NO. N/A	7. REVISION NO. AND AUTHORIZATION CD-1 Approve Alternative Selection and Cost Range		8. DATE TBD
9. APPROVED CHANGES N/A			
10. SYSTEM DESIGN DESCRIPTION Conceptual Design S&M/Utilities Operations/Infrastructure during PORTS D&D		11. PBS ELEMENT NUMBER(s) PBS PO-0040	

INTRODUCTION

In June 2000, USEC announced that it would cease uranium-enrichment operations at Portsmouth Gaseous Diffusion Plant (PORTS GDP) by June 2001.

In October 2000, then Secretary of Energy Richardson announced that DOE would keep PORTS enrichment facilities in "cold standby" (shut down but maintained and ready for restart) until 2006 and that DOE would provide non-financial support to USEC for development of a gaseous-centrifuge enrichment process that would be tested at PORTS. Later that year, USEC entered into a cooperative research and development agreement to design and build a centrifuge prototype plant at PORTS, based on DOE designs from the mid 1980s.

In March 2001, then Secretary of Energy Abraham announced that DOE had provided funding to support cold standby; in May, USEC shut down gaseous diffusion enrichment operations at PORTS. On July 31, 2001, DOE and USEC entered into a contract for maintenance of cold-standby facilities, for installation of electric heaters to winterize the former process buildings, and for removal of uranium deposits from cascade equipment; later, DOE also contracted USEC to conduct ⁹⁹Tc-contaminated feed cleanup activities. In late 2001, winterization of PORTS process facilities was completed with the installation of approximately 900 electric heaters; no significant problems have been experienced during subsequent winters—process building temperatures have been maintained at or above target levels.

Since October 2005, DOE began transitioning PORTS from cold standby to cold shutdown, prompted by the decision that no further provisions should be made to restart the PORTS enrichment cascade. Most recently, DOE has directed an emphasis on deactivation.

During the deactivation activities continued surveillance and maintenance (S&M) is necessary to ensure the real property assets, including systems, stored hazardous materials, and waste remain in a stable and known condition; and that adequate protection is provided to workers, the public, and the environment. Ongoing S&M is required throughout the transition and disposition phases of the facilities. The S&M program is an iterative process that includes periodic re-evaluation as the scope and hazards of the work evolve and transition into decontamination and decommissioning (D&D) activities. S&M will consist of requirements to operate, maintain, access, repair, and modify, as necessary, shutdown facilities, structures, including, but not limited to, all building components, heating, ventilation, and air conditioning (HVAC) systems, electrical systems, mechanical systems, lighting, roofing, and installed real property in the GDP.

LOGIC RELATIONSHIPS

Logical relationships between all facility S&M, infrastructure requirements and systems re-configuration are critical to the success of the project. These relationships are necessary to ensure that the D&D contractor's needs are met during performance of D&D, OSWDF construction and operation, and Deferred Unit (DU) remediation. Integration between these elements is essential for project success.

Integration is also required during S&M between the S&M/D&D contractor and other site tenants. Specifically, three tenants will occupy areas leased from DOE. They are:

- The Ohio National Guard, who occupies two large buildings, as well as outdoor areas, that it uses as a mobile

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05	5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	
<p>equipment garage,</p> <ul style="list-style-type: none">Uranium Disposition Services (UDS), who will design, build, and operate a DUF₆ conversion facility, andThe American Centrifuge Plant leased by the United States Enrichment Corporation (USEC). <p>While these tenants will have a continued presence on site, S&M specifically excludes their facilities and operations. Infrastructure and utilities system reconfiguration requirements during project execution will be closely coordinated to avoid any operational impacts to their missions.</p> <p>SCOPE DESCRIPTION</p> <p>S&M consists of five key elements: systems re-configurations and optimizations, operations, surveillance, maintenance, and Infrastructure landlord functions.</p> <p>With a few exceptions, the PORTS utilities and power systems are antiquated, greatly oversized for current and projected demands, and are in a general state of atrophy. The ongoing costs of operating the utilities and power systems are expensive and inefficient. Opportunities to reduce costs, while continuing to supply the future utilities and power needs for a D&D project, are available. To allow for maximum benefit the required optimizations are planned for performance early in the project. These include, but are not limited to the following utilities and systems:</p> <ul style="list-style-type: none">Recirculating Cooling Water (RCW)PowerSteamDry AirRCW Sanitary and make-up waterNitrogenSewage <p>Operations will provide reliable and cost effective utilities and services to DOE-sponsored activities on-site. Examples of utilities and services include: power, water, sewage, fire protection and suppression, security, emergency preparedness, and operation of environmental remediation facilities.</p> <p>Surveillance includes any activity that involves the scheduled, periodic inspection of a facility, equipment, or a structure as required by federal and state environmental, safety, and health regulations or DOE Orders. Surveillance demonstrates compliance, identifies problems requiring corrective action, and determines the facility's present environmental, radiological, and physical condition. More specifically, surveillance includes determining the operability of critical equipment, monitoring radiological conditions, checking safety-related items, providing for facility security controls, and assessing structural integrity of facilities.</p> <p>Preventive, predictive, and corrective maintenance ensures that property remains in a condition suitable for use as intended.</p> <p>S&M objectives include:</p> <ul style="list-style-type: none">Ensure adequate containment of contamination.Provide physical safety and security.Maintain facilities in a manner that will eliminate or mitigate hazards to workers, the public, and the environment.Maintain unique and critical structures, systems, components, and also information critical for D&D activities.Maintain facilities in a stable and secure mode to ensure they do not unreasonably degrade and impact future D&D costs and issues.Develop and implement cost-effective S&M strategies to minimize long-term financial impacts.Minimize labor requirements (particularly with regard to excess facilities).Identify and comply with applicable environmental, safety, health, and safeguards/security requirements.Incorporate safety management into all activities to protect workers, the public, and the environment.Operate needed infrastructure systems and services cost effectively. <p>The S&M program supports maintenance of each facility's authorization basis safety envelope. Therefore, like hazard</p>		

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4. WBS ELEMENT CODE PORTS.40.UD.05	5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	

baseline documentation, the S&M program will adjust as hazards change. This describes the transition of the S&M program from the current state through specific deactivation steps to a stable end state. The appropriate level of S&M has been determined using a graded approach. S&M activities for each facility or operation have been tailored to the relative risks as well as potential for financial loss and adverse impacts on safety, environmental compliance, or safeguards and security.

S&M will minimize functional activities, reduce occupation of excess facilities, and place most non-operating facilities in a “cold, tight, and dark” configuration while awaiting D&D. The cold, tight, and dark configuration describes facilities that are vacant (except during periodic surveillances), not needed for residual operations, and not required to have security access controls; additionally, most or all utilities have been discontinued. Examples of these facilities include: the X-100 administrative building, the X-633 pump house, the X-720 maintenance and stores facility, the X-533 switchyard, the X-343 feed facility, all warehouses, etc.

This configuration will achieve the optimal balance between cost and risk for facilities that have no economic value, no future program imperative, and minimal risks. This configuration was developed from in-depth examination of site activities from the perspective of meeting the aforementioned S&M objectives versus merely continuing status quo until D&D; requirements and activities that have been incumbent upon an operating or standby facility were critically questioned from a variety of viewpoints.

A primary goal of S&M entails minimizing the number of active or occupied facilities; this plan envisions that, during D&D activities four principal buildings will remain occupied with others being utilized as necessary for field crew activities during demolition (see Table 1-1).

Table 1-1. Primary facilities remaining occupied during S&M.

Building	Description	Purpose
X-326	Process building	Storage of records, regulated waste, and classified materials; monitoring of buffer pressures in process cells that have deposits exceeding “always safe mass” limits.
X-300	Plant control facility	Emergency management and monitoring—CAAS and other systems monitoring, emergency operations management, shift supervision, and various offices.
X-700	Converter maintenance facility	Central S&M headquarters, locker rooms and shower facilities, and an instrument calibration facility for CAAS support.
X-1000	Administration and office complex; lunchroom	During D&D activities an appropriate location for central operations and management must be available to support the D&D Contractor

Facilities necessary to support infrastructure, such as the X-530 switchyard, sewage treatment plant, guard portals, fire station, emergency operations center, etc. will be occupied as needed. If appropriate some structures may be utilized by D&D field operations for construction crews. Maintenance activities may involve re-configuration of services to support construction trailers if suitable facilities are not otherwise available for the D&D field crews.

All other facilities will go into the cold, tight, and dark configuration and will be visited only periodically, for purposes determined by facility function, condition, and other drivers such as regulatory and security requirements. All facilities will have access controls implemented on a graded approach, varying from separate fences with badge readers to signs and other administrative controls.

Placing facilities in a cold, tight, and dark configuration will first require prior modification of processes and amenities such as lighting, heating, ventilation, restrooms, alarm systems, and wet-pipe fire suppression systems. Additionally, access controls must be established. The cold, tight, and dark configuration will eliminate most utility costs, minimize maintenance

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05	5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	
costs, eliminate energy sources as fire initiators, and reduce access frequencies.		
<u>Infrastructure Activities requirements</u>		
During the project several activities are ongoing that are not specific to facility S&M functions or utility operations. These level of effort functions include but are not limited to the following responsibilities:		
<ul style="list-style-type: none">Records and document control as applicable to all site activities must be handled and stored in accordance with DOE requirements.The vehicle and equipment fleet assigned to support site activities must be administered in accordance with DOE order 430.1B.Maintain and administer the site-wide DOE Personal Property Management System for PORTS; maintain a record for DOE of DOE property furnished by DOE to other entities; and maintain a cradle to grave high-risk material and equipment identification and reporting process.Certified analytical laboratory services must be provided to analyze samples taken in support of site activities, including industrial hygiene, dosimetry, and bioassay.Site telecommunication and switchgear must be maintained, as well as, peripheral activities related to the telephone system. IT systems and computing support of site database and data warehouse requirements.Management of incoming and outgoing mail at the site mail room and distribution center.Management of communication radios in support of site activities is required, as well as, maintaining a license for operation of all radios on-site.Roads, railroads, and grounds must be operated and maintained; portions of the rail system required for material shipments must be maintained and approved for use.Other support to DOE is required in connection with legal or regulatory proceedings, including entering into joint legal representation agreements at DOE's request.Pest control services are required for facilities, including but not limited to, insect pest control spraying and rodent control services.		
SAFETY SYSTEMS		
An Integrated Safety Management System (ISMS), based on DOE's ISMS will be implemented that incorporates the five core functions and is based on the seven guiding principles. The objective of ISMS is to systematically integrate safety and environmental protection into the planning and execution of all work activities. The term safety encompasses Nuclear Safety, Industrial Safety, Industrial Hygiene, Occupational Health, Health Physics, and environmental issues. ISMS requirements flow-down to all project tasks and activities.		
The five core functions are: (1) define the scope of work, (2) analyze hazards, (3) develop and implement hazard controls, (4) perform work within controls, and (5) provide feedback and continuous improvement. The seven guiding principles are (1) line management responsibility for safety, (2) clear roles and responsibilities, (3) competence commensurate with responsibility, (4) balanced priorities, (5) identification of safety standards and requirements, (6) hazard control tailored to work being performed, and (7) operations authorization.		
SCOPE ASSUMPTIONS		
General		
<ul style="list-style-type: none">Gaseous diffusion equipment will be turned over to DOE in the condition described in Section 4.4 of the current		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05	5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	
<p>USEC lease (e.g., USEC will provide radiological and hazardous materials records; status reports of compliance with environmental, safety, and health regulations, etc.).</p> <ul style="list-style-type: none"> The 14 inactive facilities currently being demolished under DOE's current Environmental Restoration program, and except for the slab, foundation, and/or footer of some of the facilities as deep as four feet below grade and DU scope, fall outside the scope of this plan. Utilities and systems re-configurations and optimizations will be completed by 2012. A commercial power utility entity maintains and operates the high-voltage equipment in the X-530 and X-533 switchyards. By October 1, 2008, USEC will complete DOE's deposit removal program and ⁹⁹Tc- contaminated feed cleanup program. All lube oil, refrigerant, and process building transformer oil will be drained, sampled, analyzed and dispositioned from the site by October 1, 2008. The current environmental remediation contractor will ship off-site all containerized waste (e.g., RCRA hazardous, low-level radioactive, mixed, TSCA), including legacy waste, by the end of their contract in 2009. The entire inventory of the Uranium Materials Management Center will be dispositioned from the site by October 1, 2008. Permits for environmental outfalls will transfer to the primary user of the outfall. The only safety significant structures, systems, or components that will apply for S&M is the Criticality Accident Alarm System (CAAS) in the X-326, X-330, X-333, and X-705 and the buffer system in Building X-326. A commercial entity will supply potable water for the site after October 1, 2008. PORTS will remain at (security attractiveness level) Category III C or lower. The S&M program will collect and disposition wastes generated by S&M activities. The S&M program will <i>not</i> provide gratis utilities or services (unless contracted) to non-DOE programs (e.g., to site tenants). S&M will provide fire protection, site security, emergency preparedness, and sewage treatment services. All facility hazards will be reduced or eliminated to meet the criteria of an operational emergency base program as described in DOE Order 151.1C, <i>Comprehensive Emergency Management System</i>. Modification of current labor agreements will allow personnel other than the current fire services personnel to perform routine fire prevention activities (e.g., inspections and maintenance) and assist in fire suppression activities (e.g., fire brigade). Safeguards and security activities will continue to comply with current DOE directives; requirements will not increase. End-state goal of a widespread, industrial security environment. When operational, the American Centrifuge Plant will <i>not</i> affect S&M. With the exception of American Centrifuge Plant operations, USEC will not occupy areas or facilities at PORTS. <p>Maintenance cost estimates were based on the following assumptions:</p> <ul style="list-style-type: none"> The level of effort will correspond to facility size (or "footprint"). Ongoing operations and occupied facilities will require approximately the same maintenance tasks (but <i>not</i> costs) as currently required. S&M will use a minimum number of disparate crafts with maximum job flexibility, such as: <ul style="list-style-type: none"> Maintenance mechanics: mechanic; welder; heating, ventilation, and air conditioning technician; and sheet-metal workers. Instrument and electrical mechanics: electrician, instrument mechanic, and electronics mechanic. Building mechanics: painter, carpenter, and materials handler. Site services workers: janitor, laborer, and truck driver. S&M will subcontract large projects such as re-roofing and re-paving. A commercial power utility entity will maintain high-voltage switchyards. Maintenance will require only a standard 40-hour week (8 hours a day, 5 days a week). Overtime and contractors will be used to provide for special needs. S&M will not maintain a dedicated hospital on-site but will provide emergency medical technicians who will provide first-response care for S&M personnel. Personnel requiring additional treatment will be transported to off-site facilities. The S&M radiation protection program will comply with the DOE requirements of 10 CFR Part 835, <i>Occupational Radiation Protection</i>, and <i>not</i> the Nuclear Regulatory Commission (NRC) requirements of 10 CFR Part 20, <i>Standards for Protection Against Radiation</i>. 		

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)	2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05	5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	

- The S&M health and safety program will comply with the DOE requirements of 10 CFR Part 851, *Worker Safety and Health Program*.

RISK MANAGEMENT

The *Risk Management Plan for Decontamination and Decommissioning of the Portsmouth Gaseous Diffusion Plant* has been prepared and provides the program and methodology that will be used to assess all project risks including those related to S&M. S&M risks will be identified, assessed, handled, and monitored in accordance with this plan.

BASIS OF ESTIMATE

This Life Cycle Baseline estimate was prepared for preliminary planning purposes and is considered conceptual in nature. This estimate should be considered between a Class 3 Preliminary and Class 5 Order of Magnitude cost estimate. The estimate was prepared from an approved cost estimating model, which was developed at summary levels based on either actual historical experience for similar work or best engineering judgment. The excavation portion of the estimate required the input of the facility's gross square footage, relationship to deferred unit and historical data to derive estimate values for required soils removal. Unit prices were then applied to associated activities based on facility size, usage, and expected contamination levels.

The basic premise for CD-1 estimates are defined per the "DOE Cost Estimating Guide for Program and Project Management, DOE G 430.1-IX, April 2004." As per the DOE cost estimating guidance the project is at "Critical Decision (CD)-1, Approve Alternative Selection and Cost Range." Cost estimates prepared to support CD-1 will range from Class 5 Order of Magnitude to Class 3 Preliminary cost estimates using several cost estimating techniques.

The five DOE cost estimate classifications are based on AACE's Recommended Practice for Classifying Cost Estimates (AACE International Recommended Practice No. 17R-97; Appendix J). The following table lists all the cost estimating classifications.

Cost Estimate Classifications

Cost Estimate Classification	Primary Characteristics	
	Level of Definition (% of Complete Definition)	Cost Estimating Description (Techniques)
Class 5, Order of Magnitude	0% to 2%	Stochastic, most parametric, judgment (Parametric, specific analogy, expert opinion, trend analysis)
Class 4, Intermediate	1% to 15%	Various, more parametric (parametric, specific analogy, expert opinion, trend analysis)
Class 3, Preliminary	10% to 40%	Various, including combinations (detailed, unit-cost, or activity-based; parametric; specific analogy; expert opinion; trend analysis)

1. PROJECT TITLE/PARTICIPANT Portsmouth Deactivation & Decommissioning (D&D)		2. DATE TBD	3. IDENTIFICATION NUMBER TBD
4. WBS ELEMENT CODE PORTS.40.UD.05		5. WBS ELEMENT TITLE S&M/Infrastructure/Landlord	
Class 1, Definitive	50% to 100%	Deterministic, most definitive (detailed, unit-cost, or activity-based; expert opinion; learning curve)	

SCHEDULE ASSUMPTIONS

S&M activities will begin at the onset of the S&M/D&D project and will continue until completion of D&D.

REQUIREMENTS/DRIVERS

The following regulations apply to S&M:

- Endangered Species Act
- National Historic Preservation Act
- Archaeological and Historic Preservation Act/Archaeological Resources Protection Act
- Farmland Protection Policy Act
- Title 10 CFR Part 1022, Compliance with Floodplain/Wetlands
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- Emergency Planning and Community Right-to-Know Act
- DOE Order 430.1B and other applicable DOE Orders
- Title 10 CFR Part 851, Worker Safety and Health Program
- Underground Storage Tank Regulations
- National Environmental Policy Act (NEPA)
- Federal Insecticide, Fungicide, and Rodenticide Act

WASTE VOLUMES

Waste volumes for S&M activities are included in the Facility D&D waste volumes.

PROJECT SCHEDULE

See attached.

BASELINE BY YEAR

APPENDIX B

PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT BASELINE BY YEAR

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

PROJECT DESCRIPTION		PROJECT TOTALS
PORT.40.UD	UNDETERMINED (PORTS D&D Project Budget)	\$5,249,381,871
PORT.40.UD.01	OWNERS REPRESENTATION	\$291,475,436
PORT.40.UD.02	BUILDING AND FACILITY D&D	\$3,382,654,771
PORT.40.UD.03	WASTE DISPOSAL CELL	\$515,675,508
PORT.40.UD.04	ENVIRONMENTAL REMEDIATION / DEFERRED UNITS	\$256,517,515
PORT.40.UD.05	S&M/LANDLORD/INFRASTRUCTURE	\$803,058,641

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2007	2008	2009	2010	2011
PORT.40.UD	\$3,666,384	\$3,790,368	\$136,212,243	\$120,325,231	\$120,151,170
PORT.40.UD.01			\$4,799,887	\$4,048,751	\$4,032,718
PORT.40.UD.02	\$0	\$0	\$98,476,224	\$86,639,719	\$86,498,586
PORT.40.UD.03	\$3,666,384	\$3,790,368	\$10,106,364	\$10,106,364	\$10,106,364
PORT.40.UD.04	\$0	\$0	\$0	\$0	\$0
PORT.40.UD.05	\$0	\$0	\$22,829,768	\$19,530,397	\$19,513,502

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2012	2013	2014	2015	2016
PORT.40.UD	\$184,508,240	\$188,878,702	\$200,187,129	\$178,872,344	\$177,460,098
PORT.40.UD.01	\$10,739,518	\$10,782,305	\$10,782,305	\$10,782,305	\$10,825,092
PORT.40.UD.02	\$127,608,839	\$131,898,980	\$145,560,979	\$124,246,194	\$122,753,627
PORT.40.UD.03	\$21,474,900	\$21,474,900	\$19,121,328	\$19,121,328	\$19,121,328
PORT.40.UD.04	\$0	\$0	\$0	\$0	\$0
PORT.40.UD.05	\$24,684,983	\$24,722,517	\$24,722,517	\$24,722,517	\$24,760,051

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2017	2018	2019	2020	2021
PORT.40.UD	\$175,291,798	\$182,113,852	\$171,721,129	\$164,747,718	\$160,961,261
PORT.40.UD.01	\$10,739,518	\$10,739,518	\$10,782,305	\$10,825,092	\$10,782,305
PORT.40.UD.02	\$120,745,969	\$127,568,023	\$121,988,303	\$110,041,247	\$106,335,111
PORT.40.UD.03	\$19,121,328	\$19,121,328	\$14,228,004	\$19,121,328	\$19,121,328
PORT.40.UD.04	\$0	\$0	\$0	\$0	\$0
PORT.40.UD.05	\$24,684,983	\$24,684,983	\$24,722,517	\$24,760,051	\$24,722,517

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2022	2023	2024	2025	2026
PORT.40.UD	\$187,625,859	\$177,564,657	\$175,632,322	\$175,482,811	\$183,098,811
PORT.40.UD.01	\$10,782,305	\$10,739,518	\$10,782,305	\$10,782,305	\$11,039,026
PORT.40.UD.02	\$131,352,369	\$113,219,003	\$111,170,747	\$111,021,236	\$117,941,710
PORT.40.UD.03	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460
PORT.40.UD.04	\$783,208	\$8,935,693	\$8,971,293	\$8,971,293	\$9,184,895
PORT.40.UD.05	\$24,722,517	\$24,684,983	\$24,722,517	\$24,722,517	\$24,947,720

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2027	2028	2029	2030	2031
PORT.40.UD	\$197,393,113	\$224,042,655	\$187,108,432	\$163,697,589	\$210,885,361
PORT.40.UD.01	\$11,167,387	\$11,167,387	\$11,124,600	\$11,167,387	\$11,167,387
PORT.40.UD.02	\$131,888,249	\$158,537,791	\$125,884,731	\$118,222,513	\$146,560,355
PORT.40.UD.03	\$19,985,460	\$19,985,460	\$19,985,460	\$9,247,368	\$9,247,368
PORT.40.UD.04	\$9,291,696	\$9,291,696	\$5,090,853	\$0	\$18,849,930
PORT.40.UD.05	\$25,060,321	\$25,060,321	\$25,022,788	\$25,060,321	\$25,060,321

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2032	2033	2034	2035	2036
PORT.40.UD	\$204,560,325	\$180,742,767	\$200,854,857	\$95,136,123	\$52,615,371
PORT.40.UD.01	\$11,210,174	\$11,167,387	\$11,124,600	\$4,635,233	
PORT.40.UD.02	\$148,594,223	\$135,267,691	\$147,350,337	\$30,216,645	\$0
PORT.40.UD.03	\$9,247,368	\$9,247,368	\$9,247,368	\$9,247,368	\$7,148,028
PORT.40.UD.04	\$10,410,705	\$0	\$8,109,764	\$33,953,218	\$30,203,343
PORT.40.UD.05	\$25,097,855	\$25,060,321	\$25,022,788	\$17,083,659	\$15,264,000

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2037	2038	2039	2040	2041
PORT.40.UD	\$64,506,083	\$64,864,782	\$83,106,589	\$96,351,010	\$63,015,363
PORT.40.UD.01	\$1,942,916	\$3,677,517	\$4,278,850	\$4,262,455	\$4,278,850
PORT.40.UD.02	\$8,101,887	\$16,655,724	\$31,610,588	\$45,699,285	\$22,887,233
PORT.40.UD.03	\$7,148,028	\$9,247,368	\$9,247,368	\$9,247,368	\$9,247,368
PORT.40.UD.04	\$30,088,063	\$16,905,982	\$19,886,945	\$19,069,864	\$8,519,074
PORT.40.UD.05	\$17,225,189	\$18,378,191	\$18,082,838	\$18,072,038	\$18,082,838

APPENDIX B

Portsmouth Gaseous Diffusion Plant Decontamination and Decommissioning Baseline by Year

	2042	2043	2044	TOTALS
PORT.40.UD	\$54,366,376	\$22,578,948	\$15,264,000	\$5,249,381,871
PORT.40.UD.01	\$4,316,228			\$291,475,436
PORT.40.UD.02	\$20,110,653	\$0	\$0	\$3,382,654,771
PORT.40.UD.03	\$12,904,200	\$7,314,948	\$0	\$515,675,508
PORT.40.UD.04	\$0	\$0	\$0	\$256,517,515
PORT.40.UD.05	\$17,035,295	\$15,264,000	\$15,264,000	\$803,058,641

Portsmouth GDP Decontamination and Decommissioning Preliminary Baseline Details

Scenario VIII	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
PORT 40 UD	UNDETERMINED (PORTS D&D Project Budget)									
PORT 40 UD 01	\$3,666,384	\$3,790,368	\$136,212,243	\$120,375,231	\$170,151,170	\$184,508,240	\$198,878,702	\$200,187,129	\$178,873,344	\$177,460,898
	OWNERS REPRESENTATION									
	\$291,475,436		\$4,799,887	\$4,048,751	\$4,032,118	\$10,739,518	\$10,783,305	\$10,783,305	\$10,783,305	\$10,825,092
PORT 40 UD 02	BUILDING AND FACILITY D&D									
PORT 40 UD 02 01	\$3,382,654,771	\$0	\$98,476,224	\$86,639,719	\$86,498,586	\$127,608,839	\$131,898,980	\$145,560,979	\$124,246,194	\$122,753,627
	Contractor Project Management & Support (includes Transition /Phase I)									
	\$3,451,206,956	\$0	\$34,976,224	\$35,639,719	\$35,498,586	\$106,545,104	\$106,969,586	\$106,969,586	\$106,969,586	\$107,394,069
	\$108,022,447	\$0	\$1,541,370	\$1,570,610	\$1,564,390	\$4,695,345	\$4,714,052	\$4,714,052	\$4,714,052	\$4,732,758
	\$37,559,384	\$0	\$678,624	\$691,497	\$688,759	\$2,067,334	\$2,075,470	\$2,075,470	\$2,075,470	\$2,083,706
	\$537,992,706	\$0	\$7,676,607	\$7,822,232	\$7,791,256	\$23,384,598	\$23,477,763	\$23,477,763	\$23,477,763	\$23,576,929
	\$158,147,683	\$0	\$2,256,606	\$2,299,414	\$2,290,308	\$6,874,108	\$6,901,495	\$6,901,495	\$6,901,495	\$6,928,882
	\$83,257,768	\$0	\$1,216,541	\$1,239,619	\$1,234,710	\$3,705,847	\$3,720,611	\$3,720,611	\$3,720,611	\$3,735,376
	\$910,191,398	\$0	\$12,987,503	\$13,233,875	\$13,181,469	\$39,562,729	\$39,720,350	\$39,720,350	\$39,720,350	\$39,877,970
	\$344,737,997	\$0	\$4,919,060	\$5,012,374	\$4,992,325	\$14,984,514	\$15,044,214	\$15,044,214	\$15,044,214	\$15,103,913
	\$41,429,553	\$0	\$591,157	\$602,372	\$599,986	\$1,800,793	\$1,807,967	\$1,807,967	\$1,807,967	\$1,815,142
	\$102,446,131	\$0	\$1,461,802	\$1,489,532	\$1,483,634	\$4,452,963	\$4,470,704	\$4,470,704	\$4,470,704	\$4,488,445
	\$113,421,890	\$0	\$1,646,933	\$1,678,195	\$1,671,550	\$5,016,972	\$5,036,960	\$5,036,960	\$5,036,960	\$5,056,948
	\$2,451,206,956	\$0	\$34,976,224	\$35,639,719	\$35,498,586	\$106,545,104	\$106,969,586	\$106,969,586	\$106,969,586	\$107,394,069
	Sub-Total									
	\$103,051,801									
PORT 40 UD 02 01	02-01-01-02 Management and Integrated Support- 30 Yr Delay (phase II)									
	\$4,541,399									
	\$1,999,456									
	\$22,617,886									
	\$6,648,726									
	\$3,584,343									
	\$38,265,584									
	\$14,493,216									
	\$1,741,750									
	\$4,306,963									
	\$4,852,481									
	Contractor Project Management & Support (Includes Phase I&II, Transition & Gap analysis)									
	\$172,500,000									
	\$2,726,758,758									
PORT 40 UD 02 01	Adjustments based on GAP Analysis									
	\$15,000,000									
	\$65,000,000									
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Portsmouth GDP Decontamination and Commissioning
Preliminary Baseline Details

Scenario VIII	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
PORT 40 UD.01											
UNDETERMINED (PORTS D&D Project Budget)	\$175,291,798	\$182,113,852	\$171,721,129	\$164,747,178	\$160,961,261	\$187,625,859	\$177,564,657	\$175,632,322	\$175,482,811	\$183,098,811	\$197,393,113
OWNERS REPRESENTATION	\$10,739,518	\$10,739,518	\$10,782,305	\$10,825,092	\$10,782,305	\$10,782,305	\$10,739,518	\$10,782,305	\$10,782,305	\$11,039,026	\$11,167,387
PORT 40 UD.02											
BUILDING AND FACILITY D&D	\$120,745,969	\$127,568,023	\$121,988,303	\$110,041,247	\$106,335,111	\$131,351,369	\$113,219,003	\$111,170,747	\$111,021,236	\$117,941,710	\$131,888,249
Contractor Project Management & Support (Includes Transition /Phase I)	\$106,545,104	\$106,545,104	\$105,969,586	\$96,394,069	\$95,969,586	\$96,969,586	\$96,545,104	\$96,969,586	\$96,969,586	\$99,516,481	\$100,789,929
02-01-01-01-01 Project Management and Administration	\$4,695,345	\$4,695,345	\$4,669,983	\$4,247,998	\$4,229,292	\$4,273,361	\$4,254,654	\$4,273,361	\$4,273,361	\$4,385,600	\$4,441,720
02-01-01-01-02 Licensing and Regulatory Affairs	\$2,067,234	\$2,067,234	\$2,056,068	\$1,870,280	\$1,862,044	\$1,881,446	\$1,873,210	\$1,881,446	\$1,881,446	\$1,930,862	\$1,955,570
02-01-01-01-03 Decommissioning Planning and Engineering	\$23,384,598	\$23,384,598	\$23,258,283	\$21,156,641	\$21,063,475	\$21,282,956	\$21,189,790	\$21,282,956	\$21,282,956	\$21,841,950	\$22,121,448
02-01-01-01-04 Decommissioning Implementation	\$6,874,108	\$6,874,108	\$6,836,977	\$6,210,181	\$6,191,794	\$6,256,312	\$6,228,925	\$6,256,312	\$6,256,312	\$6,420,653	\$6,502,794
02-01-01-01-05 Nuclear Material Control and Accountability	\$3,705,847	\$3,705,847	\$3,685,829	\$3,352,774	\$3,338,010	\$3,372,792	\$3,358,027	\$3,372,792	\$3,372,792	\$3,461,378	\$3,505,671
02-01-01-01-06 Environmental, Safety, & Health Affairs	\$39,562,729	\$39,562,729	\$39,349,026	\$35,793,409	\$35,635,788	\$36,007,112	\$35,849,492	\$36,007,112	\$36,007,112	\$36,952,834	\$37,425,696
02-01-01-01-07 Waste Management	\$14,984,514	\$14,984,514	\$14,901,573	\$13,556,872	\$13,497,172	\$13,637,812	\$13,578,113	\$13,637,812	\$13,637,812	\$13,996,008	\$14,175,106
02-01-01-01-08 Quality Assurance	\$1,800,793	\$1,800,793	\$1,791,066	\$1,629,223	\$1,622,049	\$1,638,950	\$1,631,776	\$1,638,950	\$1,638,950	\$1,681,997	\$1,703,521
02-01-01-01-09 D&D Contractor Protective Services	\$4,452,965	\$4,452,965	\$4,428,910	\$4,028,709	\$4,010,968	\$4,052,762	\$4,035,021	\$4,052,762	\$4,052,762	\$4,159,208	\$4,212,430
02-01-01-01-10 D & D Sub-Contractor Management Organizations	\$5,016,972	\$5,016,972	\$4,989,872	\$4,538,983	\$4,518,995	\$4,566,082	\$4,546,094	\$4,566,082	\$4,566,082	\$4,686,010	\$4,745,974
Sub-Total	\$106,545,104	\$106,545,104	\$105,969,586	\$96,394,069	\$95,969,586	\$96,969,586	\$96,545,104	\$96,969,586	\$96,969,586	\$99,516,481	\$100,789,929
02-01-01-02 Management and Integrated Support- 30 Yr Delay (phase II)											
02-01-01-01-01 Project Management and Administration											
02-01-01-01-02 Licensing and Regulatory Affairs											
02-01-01-01-03 Decommissioning Planning and Engineering											
02-01-01-01-04 Decommissioning Implementation											
02-01-01-01-05 Nuclear Material Control and Accountability											
02-01-01-01-06 Environmental, Safety, & Health Affairs											
02-01-01-01-07 Waste Management											
02-01-01-01-08 Quality Assurance											
02-01-01-01-09 D&D Contractor Protective Services											
02-01-01-01-10 D & D Sub-Contractor Management Organizations											
Contractor Project Management & Support (Includes Phase I&II, Transition & Gap analysis)											
TOTAL											
PORT 40 UD.02.01											
Field Activities	\$14,200,865	\$21,022,919	\$16,018,717	\$13,647,178	\$10,365,525	\$34,382,783	\$16,673,899	\$14,201,161	\$14,051,650	\$18,425,229	\$31,098,320
Process Bldg.	\$14,200,865	\$21,022,919	\$16,018,717	\$13,647,178	\$10,365,525	\$34,382,783	\$16,673,899	\$14,201,161	\$14,051,650	\$18,425,229	\$31,098,320
PORT 40 UD.02.02.01 X-333	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PORT 40 UD.02.02.01.02 X-330	\$0	\$12,125,140	\$16,018,717	\$13,647,178	\$10,365,525	\$34,382,783	\$16,673,899	\$14,201,161	\$14,051,650	\$18,425,229	\$31,098,320
PORT 40 UD.02.02.01.03 X-326	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Remaining Process Model Bldgs	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Balance of Plant	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PORT 40 UD.02.02.01 Radiological Facilities	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PORT 40 UD.02.02.02 Non-Radiological Facilities	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PORT 40 UD.03											
WASTE DISPOSAL CELL	\$19,121,328	\$19,121,328	\$14,228,004	\$19,121,328	\$19,121,328	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460
On-Site Disposal	\$19,121,328	\$19,121,328	\$14,228,004	\$19,121,328	\$19,121,328	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460	\$19,985,460
Capital Construction	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092	\$10,738,092
Operations	\$8,383,236	\$8,383,236	\$0	\$8,383,236	\$8,383,236	\$5,589,252	\$5,589,252	\$5,589,252	\$5,589,252	\$5,589,252	\$5,589,252
Closure	\$0	\$0	\$0	\$0	\$0	\$3,658,116	\$3,658,116	\$3,658,116	\$3,658,116	\$3,658,116	\$3,658,116
Short Term Stewardship	\$0	\$0	\$3,489,912	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
PORT 40 UD.04											
ENVIRONMENTAL REMEDIATION / DEFERRED UNITS	\$0	\$0	\$0	\$0	\$0	\$783,208	\$8,935,693	\$8,971,293	\$8,971,293	\$9,184,895	\$9,291,696
PORT 40 UD.05											
S&M/LANDFILL/INFRASTRUCTURE	\$24,684,983	\$24,684,983	\$24,722,517	\$24,760,051	\$24,722,517	\$24,722,517	\$24,684,983	\$24,722,517	\$24,722,517	\$24,947,720	\$25,060,321
Facility S&M	\$9,470,993	\$9,470,993	\$9,458,517	\$9,496,551	\$9,458,517	\$9,458,517	\$9,458,517	\$9,458,517	\$9,458,517	\$9,687,790	\$9,796,721
Utilities Operated and	\$15,214,000	\$15,214,000	\$15,264,000	\$15,264,000	\$15,264,000	\$15,264,000	\$15,226,466	\$15,264,000	\$15,264,000	\$15,260,000	\$15,264,000

Adjustments based on GAP Analysis

Utilities, A, Services Organization, Activities

Non-remediated S&M Equipment

Workforce's activities & Management Oversight

Workforce Separation Penalties (GDP) (Case scenario, 2012 Optimized Utilities scenario)

GAP PH1 TOTALS

Portsmouth GDP Decontamination and Commissioning Preliminary Baseline Details

Scenario VIII	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039
PORT 40 UD 01												
UNDETERMINED (PORTS D&D Project Budget)	\$224,042,655	\$187,108,432	\$163,697,589	\$210,885,361	\$204,560,325	\$180,742,767	\$200,854,857	\$95,136,123	\$52,615,371	\$64,506,083	\$64,864,782	\$83,106,589
OWNERS REPRESENTATION	\$11,167,387	\$11,124,600	\$11,167,387	\$11,167,387	\$11,210,174	\$11,167,387	\$11,124,600	\$4,635,233	\$0	\$1,942,916	\$3,677,517	\$4,278,850
PORT 40 UD 02												
BUILDING AND FACILITY D&D	\$158,537,791	\$125,884,731	\$118,222,513	\$146,560,355	\$148,594,223	\$135,267,691	\$147,350,337	\$30,216,645	\$0	\$8,101,887	\$16,655,724	\$31,610,588
CONTRACTOR PROJECT MANAGEMENT & SUPPORT (PHASE I)	\$100,789,929	\$100,789,929	\$100,789,929	\$100,789,929	\$101,714,411	\$90,789,929	\$90,365,446	\$25,455,753	\$0	\$0	\$0	\$0
02-01-01-01-01 Project Management and Administration	\$4,441,720	\$4,423,013	\$4,441,720	\$4,482,461	\$4,482,461	\$4,001,029	\$3,982,322	\$1,121,812	\$0	\$0	\$0	\$0
02-01-01-01-02 Licensing and Regulatory Affairs	\$1,955,570	\$1,947,334	\$1,955,570	\$1,955,570	\$1,975,507	\$1,761,546	\$1,753,310	\$493,904	\$0	\$0	\$0	\$0
02-01-01-01-03 Decommissioning Planning and Engineering	\$22,121,448	\$22,028,282	\$22,121,448	\$22,121,448	\$22,324,354	\$19,926,640	\$19,833,475	\$5,587,047	\$0	\$0	\$0	\$0
02-01-01-01-04 Decommissioning Implementation	\$6,502,794	\$6,475,407	\$6,502,794	\$6,502,794	\$6,532,440	\$5,857,611	\$5,830,224	\$1,642,562	\$0	\$0	\$0	\$0
02-01-01-01-05 Nuclear Material Control and Accountability	\$3,505,671	\$3,490,906	\$3,505,671	\$3,505,671	\$3,537,826	\$3,157,851	\$3,143,087	\$885,401	\$0	\$0	\$0	\$0
02-01-01-01-06 Environmental, Safety, & Health Affairs	\$37,425,696	\$37,268,075	\$37,425,696	\$37,425,696	\$37,768,978	\$33,712,458	\$33,554,838	\$9,452,326	\$0	\$0	\$0	\$0
02-01-01-01-07 Waste Management	\$14,175,106	\$14,115,407	\$14,175,106	\$14,175,106	\$14,305,125	\$12,768,705	\$13,709,006	\$3,580,100	\$0	\$0	\$0	\$0
02-01-01-01-08 Quality Assurance	\$1,703,521	\$1,693,346	\$1,703,521	\$1,703,521	\$1,719,146	\$1,534,504	\$1,527,329	\$400,245	\$0	\$0	\$0	\$0
02-01-01-01-09 D&D Contractor Protective Services	\$4,194,689	\$4,212,430	\$4,194,689	\$4,212,430	\$4,251,068	\$3,794,489	\$3,776,748	\$1,063,902	\$0	\$0	\$0	\$0
02-01-01-01-10 D & D Sub-Contractor Management Organizations	\$4,745,974	\$4,725,986	\$4,745,974	\$4,745,974	\$4,789,506	\$4,275,096	\$4,255,108	\$1,198,655	\$0	\$0	\$0	\$0
Sub-Total	\$100,789,929	\$100,365,446	\$100,789,929	\$100,789,929	\$101,714,411	\$90,789,929	\$90,365,446	\$25,455,753	\$0	\$0	\$0	\$0
PORT 40 UD 03												
02-01-01-02 Management and Integrated Support- 30 Yr Delay (Phase II)												
02-01-01-01-01 Project Management and Administration										\$8,101,887	\$16,479,838	\$19,500,410
02-01-01-01-02 Licensing and Regulatory Affairs										\$357,043	\$726,251	\$859,365
02-01-01-01-03 Decommissioning Planning and Engineering										\$157,196	\$319,749	\$378,355
02-01-01-01-04 Decommissioning Implementation										\$1,778,208	\$3,617,007	\$4,279,964
02-01-01-01-05 Nuclear Material Control and Accountability										\$522,720	\$1,063,251	\$1,258,133
02-01-01-01-06 Environmental, Safety, & Health Affairs										\$281,799	\$573,201	\$678,262
02-01-01-01-07 Waste Management										\$3,008,423	\$6,119,356	\$7,240,966
02-01-01-01-08 Quality Assurance										\$1,139,450	\$2,317,726	\$2,742,540
02-01-01-01-09 D&D Contractor Protective Services										\$136,936	\$278,537	\$329,590
02-01-01-01-10 D & D Sub-Contractor Management Organizations										\$338,612	\$688,761	\$815,003
Sub-Total										\$8,101,887	\$16,479,838	\$19,500,410</

Portsmouth GDP Decontamination and Remediation - Commissioning
Preliminary Baseline Details

Scenario VIII	2040	2041	2042	2043	2044	Totals
PORT 40 UD						
UNDETERMINED (PORTS D&D Project Budget)	\$96,351,010	\$63,015,363	\$54,366,376	\$22,578,948	\$15,264,000	\$5,249,381,871
PORT 40 UD.01						
OWNERS REPRESENTATION	\$4,262,455	\$4,278,850	\$4,316,228			\$291,475,436
PORT 40 UD.02						
BUILDING AND FACILITY D&D	\$45,699,285	\$22,887,233	\$20,110,653	\$0	\$0	\$3,383,654,771
PORT 40 UD.02.01						
Contractor Project Management & Support (includes Transition /Phase I)	\$0	\$0	\$0	\$0	\$0	\$2,451,206,953
02-01-01-01-01 Project Management and Administration						\$108,022,447
02-01-01-01-02 Licensing and Regulatory Affairs						\$47,559,384
02-01-01-01-03 Decommissioning Planning and Engineering						\$537,992,705
02-01-01-01-04 Decommissioning Implementation						\$158,147,683
02-01-01-01-05 Nuclear Material Control and Accountability						\$85,257,768
02-01-01-01-06 Environmental, Safety, & Health Affairs						\$910,191,397
02-01-01-01-07 Waste Management						\$344,737,996
02-01-01-01-08 Quality Assurance						\$41,429,552
02-01-01-01-09 D&D Contractor Protective Services						\$102,446,131
02-01-01-01-10 D & D Sub-Contractor Management Organizations						\$115,421,890
Sub-Total						\$2,451,206,953
02-01-01-02 Management and Integrated Support- 30 Yr. Delay (phase II)	\$19,425,696	\$19,500,410	\$20,043,564	\$0	\$0	\$103,051,805
02-01-01-01-01 Project Management and Administration	\$856,073	\$859,365	\$883,302	\$0	\$0	\$4,541,399
02-01-01-01-02 Licensing and Regulatory Affairs	\$376,906	\$378,355	\$388,894	\$0	\$0	\$1,999,456
02-01-01-01-03 Decommissioning Planning and Engineering	\$4,262,566	\$4,279,964	\$4,399,176	\$0	\$0	\$22,617,886
02-01-01-01-04 Decommissioning Implementation	\$1,253,313	\$1,258,133	\$1,293,176	\$0	\$0	\$6,648,726
02-01-01-01-05 Nuclear Material Control and Accountability	\$675,664	\$678,262	\$697,154	\$0	\$0	\$3,584,343
02-01-01-01-06 Environmental, Safety, & Health Affairs	\$7,213,223	\$7,240,966	\$7,442,652	\$0	\$0	\$38,265,584
02-01-01-01-07 Waste Management	\$2,732,032	\$2,742,540	\$2,818,929	\$0	\$0	\$14,493,216
02-01-01-01-08 Quality Assurance	\$338,327	\$329,590	\$338,770	\$0	\$0	\$1,741,750
02-01-01-01-09 D&D Contractor Protective Services	\$811,881	\$815,003	\$837,704	\$0	\$0	\$4,306,963
02-01-01-01-10 D & D Sub-Contractor Management Organizations	\$914,713	\$918,231	\$943,807	\$0	\$0	\$4,852,481
Sub-Total	\$19,425,696	\$19,500,410	\$20,043,564	\$0	\$0	\$103,051,805
PORT 40 UD.02.01						
Contractor Project Management & Support (includes Phase I&II, Transition & Gap analysis)						\$2,726,758,758
TOTAL						
Adjustments based on GAP Analysis						\$172,500,000
Utilities & Services Optimization Activities						\$15,000,000
Non-Optimized S&M Equipment						\$63,000,000
Workforce Continuity & Management Oversight						\$75,000,000
Workforce Support from Portsmouth 2009 (Cost avoidance, 2012 Optimized Utilities services)						\$19,500,000
PORT 40 UD.02.02						
Field Activities	\$26,273,589	\$3,386,823	\$67,089	\$0	\$0	\$655,896,013
Process Bldgs.	\$0	\$0	\$0	\$0	\$0	\$442,478,384
PORT 40 UD.02.02.01 X-333	\$0	\$0	\$0	\$0	\$0	\$133,319,333
PORT 40 UD.02.02.01 X-370	\$0	\$0	\$0	\$0	\$0	\$142,087,666
PORT 40 UD.02.02.01 X-326	\$0	\$0	\$0	\$0	\$0	\$161,804,674
Remaining Process Model Bldgs	\$6,673,589	\$3,386,823	\$67,089	\$0	\$0	\$5,266,711
Balance of Plant	\$0	\$0	\$0	\$0	\$0	\$213,417,629
PORT 40 UD.02.02.01 Radiological Facilities	\$26,273,589	\$3,386,823	\$67,089	\$0	\$0	\$23,794,997
PORT 40 UD.02.02.02 Non-Radiological Facilities	\$0	\$0	\$0	\$0	\$0	\$189,622,632
PORT 40 UD.03						
WASTE DISPOSAL CELL	\$9,247,368	\$9,247,368	\$12,904,200	\$7,314,948	\$0	\$515,675,508
On-Site Disposal	\$9,247,368	\$9,247,368	\$12,904,200	\$7,314,948	\$0	\$515,675,508
Capital Construction	\$0	\$0	\$0	\$0	\$0	\$252,535,116
Operational	\$5,589,252	\$5,589,252	\$5,589,252	\$0	\$0	\$164,878,440
Closure	\$3,658,116	\$3,658,116	\$7,314,948	\$7,314,948	\$0	\$87,792,216
Short Term Storage	\$0	\$0	\$0	\$0	\$0	\$10,469,736
PORT 40 UD.04						
ENVIRONMENTAL REMEDIATION / DEFERRED UNITS	\$19,069,864	\$8,519,074	\$0	\$0	\$0	\$256,517,515
PORT 40 UD.05						
S&M/LANDFILL/INFRASTRUCTURE	\$18,072,038	\$18,082,838	\$17,035,295	\$15,264,000	\$15,264,000	\$803,058,641
Facility S&M	\$2,808,038	\$2,818,038	\$1,771,295	\$15,264,000	\$15,264,000	\$253,554,641
Utilities Oper/Landfill	\$15,264,000	\$15,264,000	\$15,264,000	\$15,264,000	\$15,264,000	\$549,504,000

APPENDIX C

PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT SCHEDULE

APPENDIX D

PORTSMOUTH GASEOUS DIFFUSION PLANT D&D PROJECT ESTIMATE SUMMARY W/RANGES

APPENDI.

Portsmouth Gaseous Diffusion Plant D&D Project Estimate Summary

PORTS D&D Project Estimate Summary								
Scenario	I Prompt No Size Reduction On-Site Disposal CERCLA	II Phased No Size Reduction On-Site Disposal CERCLA	III Prompt No Size Reduction Off-Site Disposal CERCLA	IV Prompt Size Reduction On-Site Disposal CERCLA	V Prompt Size Reduction Off-Site Disposal CERCLA	VI Prompt No Size Reduction On-Site Disposal RCRA	VII 30-Year Surveillance & Maintenance	VIII 3 Year S&M Phased No Size Reduction On-Site Disposal CERCLA
Owner's Rep	\$182,514,543	\$200,326,936	\$182,514,543	\$182,514,543	\$182,514,543	\$205,996,887	\$0	\$291,475,436
D&D	\$2,383,370,083	\$2,466,326,302	\$2,775,589,210	\$2,629,531,328	\$2,896,643,715	\$2,600,089,178	\$0	\$3,382,654,771
With Onsite Cell	\$339,701,118	\$497,866,000	\$0	\$339,701,118	\$0	\$339,701,118	\$0	\$515,675,508
Offsite Disposal*	\$0	\$0	\$2,432,144,200	\$0	\$2,416,033,900	\$0	\$0	\$0
Environmental Remediation	\$256,517,516	\$256,517,516	\$591,043,713	\$256,517,516	\$591,043,713	\$256,517,516	\$0	\$256,517,515
S&M/LL	\$437,346,035	\$724,171,939	\$437,346,034	\$437,346,034	\$479,428,240	\$459,801,999	\$1,841,608,000	\$803,058,641
Total	\$3,599,449,295	\$4,145,208,693	\$6,418,637,700	\$3,845,610,539	\$6,565,664,111	\$3,862,106,498	\$1,841,608,000	\$5,249,381,871
-30%	\$3.60	\$4.15	\$6.42	\$3.85	\$6.57	\$3.86	\$1.84	\$5.25
	\$2,519,614,507	\$2,901,646,085	\$4,493,046,390	\$2,691,927,377	\$4,595,964,878	\$2,703,474,549	\$1,289,125,600	\$3,674,567,310
+50%	\$5,399,173,943	\$6,217,813,040	\$9,627,956,550	\$5,768,415,809	\$9,848,496,167	\$5,793,159,747	\$2,762,412,000	\$7,874,072,807
Scenario Start	2008	2008	2008	2008	2008	2008	2008	2009
Scenario End	2026	2044	2026	2026	2026	2026	2037	2044
*Note	Off-site disposal for the On-site scenarios is included in the D&D estimates. The tipping fee for disposal in those scenarios is approximately \$15.7M.							